Course Numbering System

Course numbers in the University system indicate course level:

- **0xxx** .......... No credit
- **1xxx** .......... Introductory level—primarily for freshmen and sophomores
- **3xxx** .......... Intermediate level—primarily for juniors and seniors, but open to sophomores with a C average overall and in prerequisites
- **5xxx** .................. Advanced level —open to juniors, seniors, and graduate students, and to third-quarter sophomores by Student Scholastic Standing Committee approval (arranged in college advising offices). May carry graduate credit for graduate students.
- **8xxx** ................. Graduate level—open only to students registered in the Graduate School. Not listed in this bulletin.
- **xxx0** ................. May be repeated for credit, if a CLA course (course numbers in other University divisions do not always follow this system).
- **3970 or 5970** .... Directed studies courses
- **3980 or 5980** .... Directed instruction courses
- **3990 or 5990** .... Directed research courses

Symbols and Abbreviations

Prefixes .......... Two-, three-, or four-letter department designator (e.g., Engl for English).

- **f,w,s,su** ................. Fall, winter, spring quarter, summer session.
- **Cr** ......................... Credits per quarter; first number following course title.
- **1011, 1012, 1013** . Series courses, separated by commas; may be entered any quarter.
- **1011-1012-1013** .. Sequence courses, separated by hyphens; must be taken in order listed.

- **!** ............................ Work for this course will extend past the end of the term. A grade of K will be assigned to indicate that the course is still in progress.

- **†** ........................... All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence.

- **§** .......................... Credit will not be granted if credit has been received for the course listed after this symbol.

- **¶** .......................... Concurrent registration is required (or allowed) in the course listed after this symbol.

- **#** .......................... Approval of the instructor is required for registration.

- **∆** .......................... Approval of the department offering the course is required for registration.

- **Q** .......................... Approval of the college offering the course is required for registration.

- **H** .......................... Honors course (follows the course number).

- **,** ............................ In prerequisite listings, comma means “and.”

- **UC** ......................... University College (formerly CEE)

A prerequisite course listed by number only (e.g., prereq 1103) is in the same department as the course being described.

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**Aerospace Studies**

See Reserve Officers Training Corps.

**Afro-American and African Studies**

**Staff**—Chair, Rose Brewer, 883 Social Sciences Building; Director of Undergraduate Studies, Victoria Coifman, 825 Social Sciences Building; Director of Graduate Studies, Charles Pike, 878 Social Sciences Building; Director of African Studies Council, Teirab AshShareef, 872 Social Sciences Building

**Professors:** Farah, Isaacman, McCurdy, Porter, Scott

**Associate Professors:** Atkins, Brewer, Nimtz, Taborn, Wright

**Assistant Professors:** AshShareef, Coifman, Dillard, Pike

**Education Specialist:** Kadi

The Afro-American and African studies major provides students with comprehensive knowledge and understanding of the Afro-American and African experience from a multidisciplinary perspective including history, political science, sociology, psychology, literature, music, and art. Courses and faculty are drawn from the department as well as from other units of the University. The program of study is based on the belief that the study of Afro-American and African peoples, both within Africa and throughout the Western Hemisphere, constitutes a distinct and interrelated area of study of the African Diaspora. Students may choose one of three curriculum tracks (integrated studies of African peoples, Afro-American studies, and African studies), and within each track will select a concentration such as public policy-developmental studies, literature and the arts, or a more traditional disciplinary focus. Detailed requirements are contained in the Student Handbook of the department, which may be obtained from the Department of Afro-American and African Studies, 808 Social Sciences Building, University of Minnesota, 267 19th Avenue, Minneapolis, MN 55455.

**General Education**—Afro-American and African studies courses are for non-majors as well as majors. Most courses below 5xxx are open to students with little or no previous work in the subject.
Many courses have been approved for CLA’s world studies or U.S. cultural pluralism requirement or for the liberal education curriculum (see page 8).

**Internship Opportunities**—The department offers credit toward the major for internships with the Minnesota Studies in International Development in Africa, the Caribbean, and Latin America, as well as approved internships with local or other international organizations. Internships may be individually arranged by students, but in all cases arrangements for credit toward the major must be approved in advance by the faculty undergraduate adviser. In some instances acceptance for internships is limited. Information about internships may be obtained from the Global Campus and OSLO, as well as from the faculty adviser.

**Study Abroad**—The department strongly encourages students to incorporate foreign study into their programs. Relevant opportunities include grassroots development internships in Kenya and Senegal; student exchange programs in Ghana, Ivory Coast, Kenya, Tanzania, and Togo; and year-long scholarships to Tanzania and Tunisia. In addition, an African country is sometimes included among the four independent research sites offered through the SPAN program. For information on options and procedures, see Foreign Study.

**B.A. Major Sequence**

**Required Preparatory Courses**—All students must complete 1011 or 1021.

**Major Requirements**—Completion of 50-54 3xxx or 5xxx credits, to include a 3xxx or 5xxx statistics or methods course approved by the undergraduate adviser; sequences in Afro-American history and/or African history, 28 credits in group concentration and breadth requirements; at least 4 credits from a course that examines gender issues; one 5xxx seminar or proseminar; and a senior paper. Students may receive a maximum of 8 credits toward the major for approved internships. Specific requirements vary depending on selected track. Consult the Student Handbook of the Department of Afro-American and African Studies for details. Students selecting to major in Afro-American and African studies must consult with the department’s undergraduate adviser to establish an approved program.

**Minor Requirements**—24 3xxx or 5xxx credits from one of the major tracks. No more than 4 credits may be from directed study, and no more than 4 credits may be taken S-N. The minor program must be approved by the faculty undergraduate adviser.

**Afro-American Studies (Afro)**

**Afro 1011. Introduction to Afro-American Studies. (4 cr)**
Materials and methods of Afro-American studies; topics such as the African background, the evolution of black society and popular culture, comparative race relations, black feminism and societal change, and economic development theories.

**Afro 3025. Black Americans: Socialization, Personality, and Behavior. (4 cr)**
Taborn
Development of the black psyche and of the black person and black culture.

**Afro 3061. The Black Family. (4 cr)**
Brewer
Sociological view of the black family up to the present.

**Afro 3072. Racism: Social-Psychological Consequences for Black Americans. (4 cr, §5072)**
Taborn
Racism and its effects on black Americans; definitions, determinants, and dynamics. Examined in an experiential context to reflect individual and institutional racism in milieus of student interest.

McCurdy
Origins, growth, and development of jazz; economic and sociological factors that influenced its development.

**Afro 3301. Music of Black Americans. (4 cr)**
McCurdy
Historical development of music of black Americans, including spiritual, gospel, blues, soul, jazz, and classical; formal music education processes influential in creating black musical styles. Live performances by local black musicians.

**Afro 3334. Black Women. (4 cr)**
Brewer
Interdisciplinary study of the experience of black women in the United States, including economic, political, and social factors, psycho-sexual development, and familial roles.

**Afro 3543. Psychology and the Black American Experience. (4 cr; prereq 1025, Psy 1001 or # Taborn)**
Historical and contemporary perspective of the relationship between the area of psychology and black Americans in research and practice.

**Afro 3591. Introduction to Afro-American Literature. (4 cr, §Engl 3591)**
Wright
Afro-American autobiography, fiction, essay, poetry, and drama from the late-18th to the mid-20th century.

**Afro 3592. Introduction to Black Women Writers. (4 cr, §Engl 3592)**
Reyes
Literary tradition of Afro-American women writers explored in novels, short stories, poetry, essay, autobiography, and drama from the 18th to the 20th century.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Afro 3864, 3865. Afro-American History. (4 cr per qtr; §Hist 3864, §Hist 3865) Dillard
3864: African background to reconstruction. 3865: Reconstruction to present.

Afro 3910. Topics in Afro-American/African Studies. (4 cr)
Topics specified in Class Schedule.

Afro 3954. Sociological Perspectives on Race, Class, and Gender. (4 cr) Brewer
Focuses on a societal-level analysis of race, class, and gender inequality. Examines how the three forms of inequality operate independently and in conjunction with one another in American institutions and society.

Afro 3970. Directed Studies. (1-15 cr)
Guided individual reading or study.

Afro 3991-3992-3993. Senior Project in Afro-American and African Studies. (2 cr per qtr; prereq completed CLA composition requirement, permission of undergrad adviser)
Continuous (X) registration three-quarter course for writing of senior paper under the guidance of a faculty supervisor.

Afro 5072. Racism: Social-Psychological Consequences for Black Americans. (4 cr, §3072) Taborn
For description, see Afro 3072.

Afro 5181. Contemporary Black Theatre: 1960-Present. (4 cr, §Th 5181) Bellamy
Essays, plays, playwrights, and theaters that have contributed significantly to contemporary black theater. From the beginning of the Black Arts Movement to the present.

Historical survey of significant events in the development of an American black theatrical tradition. Chronological presentation of essays, plays, playwrights, and theaters from early colonial references to the Black Arts Movement.

Afro 5200. Black Americans and Mental Health. (4 cr) Taborn
Analysis of factors and issues affecting mental health of black Americans and current trends in public policies.

Afro 5352. Black Families in Comparative Perspective. (4 cr) Brewer
Cross-cultural perspectives of family formation, social structure, and gender patterns of families of African descent.

Afro 5401. Field Study in Afro-American and African Studies. (1-8 cr; prereq major or minor or affiliated)
Supervised field study and experience with relevant aspects specifically focused on Afro-American and/or African culture(s), language(s), and development.

Contextual readings of 19th- and 20th-century black novelists such as Charles Chesnutt, James Weldon Johnson, Zora Neale Hurston, Richard Wright, Chester Himes, Ann Petry, James Baldwin, John Williams, Toni Morrison, and Ishmael Reed.

A multidisciplinary review of the Jazz Age’s Harlem Renaissance: literature, popular culture, visual arts, political journalism, and black and white figures such as Jean Toomer, Claude McKay, Langston Hughes, Bessie Smith, DuBose Heyward, Carl Van Vechten, Eugene O’Neill, and Marcus Garvey.

Afro 5598. Seminar: The Black Arts Renaissance, 1960s and 1970s. (4 cr; prereq major or minor or # Wright)

Afro 5701-5702. Proseminar: Afro-American Studies. (4 cr, §3701-3702)
Exploration of classic works in Afro-American studies. Comparatist framework for Afro-American studies; cultural criticism and related issues in multidisciplinary study.

Afro 5900s. Afro-American Seminar. (2-4 cr per qtr; prereq jr or sr or grad)
Scholars in Afro-American studies help students develop research projects.

Afro 5910. Topics in Afro-American/African Studies. (4 cr)
Topics specified in Class Schedule.

Afro 5970. Directed Studies. (1-6 cr per qtr; prereq #; qualified sr and grad students may register with # for work on tutorial basis)
Guided individual reading or study.

African Studies (Afro)
See history, geography, and political science for additional African studies courses.

Afro 1021. An Introduction to Africa. (4 cr) Coifman
Diverse elements of African studies curriculum, content, and methodology. Historical perspective and present trends.

Afro 3001, 3002. Introduction to West African History. (4 cr) Coifman
3001: Until 1800. 3002: 1800 to present.

Afro 3011. Islam in Africa. (4 cr) AshShareef
Ideological, doctrinal, and ritual aspects of Islam in continental Africa. Various religious brotherhoods and Sufi orders from different African countries in the 20th century: the Ansar, the Khatiyya, the Muslim Brothers, the Qadiriyya, the Republican Brothers, the Sanusiyya, the Tijaniyya. All readings in English.

African urban development through time. Links between towns and countryside. Regal-ritual cities; trading cities and city-states; administrative cities; colonial cities and company towns; contemporary cities and illegal urban settlements.
Afro 3110. Study of an African Language. (4 cr) Introduction to a selected African language. Emphasis on oral communication skills and cultural context. Section 1: Modern Arabic; Section 2: Swahili; Section 3: Wolof.

Afro 3431. History of Africa to 1800. (4 cr; §Hist 1431, §Hist 3431) Socioeconomic, political, and cultural development in precolonial Africa; emphasis on the slave trade, Islamic revolution, and European commercial penetration.


Afro 3601. Introduction to African Literature. (4 cr) Pike Oral and written African literature of the 19th and 20th centuries. All readings in English.


Afro 3970. Directed Studies. (1-15 cr) Guided individual reading or study.

Afro 3991-3992-3993. Senior Project in Afro-American and African Studies. (2 cr per qtr; prereq completed CLA composition requirement, permission of undergrad adviser) Continuous (X) registration three-quarter course for writing of senior paper under the guidance of a faculty supervisor.


Afro 5145. Development in Africa. (4 cr, §Geog 5145, §IntR 5145; prereq # Scott Economic, political, and social development in Africa from independence to the present, emphasizing the reordering of colonial landscape, bases for North-South relations, big power interventions, and participation in the world economy.


Afro 5551. Use of Oral Traditions as Resources for History: Methods. (4 cr) Colfman Use of spoken information through time, mainly in nonliterate societies, as sources for writing history. Use of canons of history to analyze and critique oral traditions and integrate them into written history.


Afro 5800. African Studies Interdisciplinary Seminar. (4 cr) Seminar staffed by cooperating faculty from social sciences and humanities. Selected themes that benefit from interdisciplinary analysis.


Afro 5970. Directed Studies. (1-6 cr per qtr; prereq # qualified sr and grad students may register with # for work on tutorial basis) Guided individual reading or study.
Arabic (Arab)

Arab 1101-1102-1103. Beginning Arabic. (5 cr per qtr) Kadi
Fundamentals of Arabic based on an audio-lingual method; aural comprehension, pronunciation, practical reading knowledge. Basic grammar.

Arab 1201-1202-1203. Colloquial Arabic. (5 cr per qtr)
Introductory course primarily for business persons and travelers. Fundamentals of vocabulary and sentence structure, introduction to Arabic script.

Arab 1536. The Religion of Islam. (4 cr, §MELC 1536, RelS 3036, 5036, SALC 3036, 5036) Farah
The rise of Islam in historical context; the role of Muhammad, Koran, traditions; fundamentals and observances of the faith; sectarian movements; the spread of Islam into Asia and Africa; Baha’i and Black Muslim components; reformist movements and change.

Arab 3036. The Religion of Islam. (4 cr, §MELC 5035, RefS 3036, 5036, Arab 3036, 5036) Farah
The evolution of Islam in historical context; institutions that made for diversity and continuity; traditions, law and observances of the faith; sectarian movements; philosophical and theological trends; modern developments: reformist, revolutionary, and militant.

Arab 3101-3102-3103. Intermediate Arabic. (5 cr per qtr; prereq 1103 or #) Kadi
Review of grammar; analysis of cultural and literary texts; contemporary short stories (third quarter).

Arab 3213. The Qur’an as Literature. (4 cr, §Mid E 3213) AshShareef
Texts and commentaries in translation. Knowledge of Arabic not required.

Arab 3301. Modern Arabic Poetry in Translation. (4 cr, §5501, §MIdE 3301, §MidE 5501) AshShareef

Arab 3302. The Arabic Novel in Translation. (4 cr, §5502, §MIdE 3302, §MidE 5502) AshShareef

Arab 3303. Arabic Drama in Translation. (4 cr, §5503, §MidE 3303, §MidE 5505) AshShareef

Arab 3491. Classical Heritage of Arab Islam. (4 cr, §Hist 3491) Farah
Arab contributions to institutions, literature, arts, sciences, thought, mathematics, and architecture; Islam’s development and spread to Europe. Role of the Arab Islam in shaping Islamic civilization, 650-1350 A.D.

Arab 3501, 3542, 3543. History of the Arabs. (4 cr per qtr, §Hist 3501, §Hist 3542, §Hist 3543) 3541: Pre-Islamic days to downfall of Umayyads of Damascus. 3542: Abbasids to fall of Baghdad in 1258. 3543: Crusades to present.

Arab 3544. The Arab World in Recent Time. (4 cr, §Hist 3544) Farah
Central Arab lands (Arabian peninsula, Iraq, Syria, Jordan, Lebanon, Egypt) and North African region (Libya, Tunisia, Morocco, Algeria) from end of World War I to the present. Foreign occupation and struggle for independence, position in regional and international politics.

Arab 3545. Islamic Mysticism. (4 cr, §Hum 3545, §Hum 5545) Farah
The rise of Sufism, from asceticism to theosophical mysticism; the leading historical personalities, their beliefs and preaching; relationship to Orthodox Islam and non-Muslim mystical movements; concepts and organizations; the place of Sufism in modern religious trends.

Arab 3547. History of the Ottoman Empire. (4 cr, §Hist 3547) Farah
History and institutions of the Ottoman Empire from its inception in 1300 until its demise in 1920; includes both Asiatic and European provinces; relations with other powers in Europe and Asia; its role in world affairs.

Arab 5001. Introduction to Research in Arabic Studies. (4 cr) Youssif
Skills and techniques required to deal with medieval and modern works in Arabic literature and Islam. A survey of the most important research bibliographies in Arabic and Islamic studies. Bibliographic references presented in English and in Arabic if sufficient interest.

Arab 5036. The Religion of Islam. (4 cr, §MELC 3036, 5036, Arab 3036, 5036) For description, see Arab 3036.

Arab 5501. Modern Arabic Poetry. (4 cr, §3301, §MidE 3301, §MidE 5501) AshShareef
Arab 5502. The Arabic Novel. (4 cr, §3302, §MidE 3302, §MidE 5502) AshShareef

Arab 5503. Arabic Drama. (4 cr, §3303, §MidE 3303, §MidE 5503) AshShareef

Arab 5505. Survey: The Middle East. (4 cr, §Hist MELC 3505, Hist 3505, Arab 3505, 5505) Farah
For description, see Arab 1505.

Arab 5523. The Middle East in World Affairs: The 19th Century. (4 cr, §MELC 5523) Farah
Structure of society; cultural and political impact of the West; revivalist and nationalist trends; reformist and separatist movements.

Arab 5545. Islamic Mysticism. (4 cr, §Hum 3545, §Hum 5545)
For description, see Arab 3545.

Arab 5546. Theological and Mystical Doctrines of Islam. (4 cr, §RelS 5546, §MELC 5546) Farah
Classical works of scholastics and Mystics; jurists and philosophers; landmarks of Islamic religious beliefs and institutions. Content analysis, commencing with the Qur’an and the traditions.

Arab 5730. Proseminar in Middle East History: 16th to 19th Century. (4 cr, §Hist 5730) Farah
Topics, which vary quarterly, on Mamluk, Safavid-Qajar, and Ottoman era concerning relations with each other and outside world. Political, diplomatic, and ideological orientations and conflicts; cultural and social trends; commerce; transformations due to Western impact, secularization, and modernization and colonial encroachments, which shaped new ideological trends and gave rise to nationalism and Islamic activism.

Arab 5900. Topics in Arabic Literature. (4 cr per qtr [12 cr max]; prereq 5103 or #) AshShareef
Readings and discussion of selected works in Arabic. Topics specified in Class Schedule.

Arab 5970. Directed Readings. (Cr ar; prereq 5103 or #)
Special problems for advanced students. Reading and periodic consultations.

Arab 5990. Honors Course: Research. (Cr ar; prereq 5970 or #)
Individual studies for honors work at an advanced level.

College of Agricultural, Food, and Environmental Sciences (COAFES)
CLA students will find courses to satisfy liberal education requirements in the College of Agricultural, Food, and Environmental Sciences. The college also offers a broad range of majors and courses, including plant and animal sciences, scientific and technical communication, natural resources and environmental studies, food science and nutrition, education, economics and business, pre-veterinary medicine, and international trade and development. Pre-agriculture advisers are available in the CLA advising offices. Course descriptions and programs can be found in the College of Agricultural, Food, and Environmental Sciences Bulletin. For more information, contact the college in 277 Coffey Hall, St. Paul (612/624-3009).

Akkadian
See Classical and Near Eastern studies.

American Indian Studies (AmIn)

Staff—Chair, David O. Born
Adjunct Faculty—Professor: Born (American Studies, Health Ecology)
Associate Professor: Miller (American Studies)
Assistant Professor: O’Brien (History)
Teaching Specialist: Buckanaga, Buffalohead, Firesteel, Jones
Lecturer: Danforth, Libertus

American Indian studies is concerned with traditional and contemporary Indian nations, tribes, bands, and groups located in what is now the United States and Canada.

B.A. Major Sequence
Required Preparatory Course—1771

Major Requirements—
Language focus—43-45 cr AmIn, all levels.
Six-course sequence in Ojibwe or Dakota language. 14 or more cr AmIn 3xxx, 5xxx. Senior project.

Non-language focus—43-45 cr AmIn, all levels.
39 or more cr AmIn 3xxx, 5xxx. Senior project.

Minor Requirements—16 credits in American Indian studies 3xxx or 5xxx courses selected

Akkadian
See Classical and Near Eastern studies.
with approval of adviser. Only one course may be taken S-N. Grades of C or better must be earned in A-F courses. Only one course may be taken as directed study.

**Language**

AmIn 1021-1022-1023. Beginning Ojibwe. (5 cr per qtr) Jones
Acquisition of speaking skills, fundamentals of grammar, and writing systems.

AmIn 1031-1032-1033. Beginning Dakota. (5 cr per qtr) Firesteel
Acquisition of speaking skills, fundamentals of grammar, and writing systems.

AmIn 3024-3025-3028. Intermediate Ojibwe. (5 cr per qtr; prereq 1023) Jones
Improving speaking skills; grammatical structures; storytelling, oral history, and translation projects.

AmIn 3034-3035-3038. Intermediate Dakota. (5 cr per qtr; prereq 1033) Firesteel
Improving speaking skills; grammatical structures; storytelling, oral history, and translation projects.

**General Courses**

AmIn 1771. Introduction to American Indian Studies. (4 cr)
Content, methods, and objectives of American Indian studies. Images of the American Indian, persistence and change in American Indian communities, linguistics and literature, and tribal ethnohistories.

AmIn 3026. Ojibwe Culture and History. (4 cr) J ones
Ojibwe perspectives on the processes of change and maintenance in Ojibwe society; role of cultural traditions in the lives of the Anishinabe.

AmIn 3036. Dakota Culture and History. (4 cr) Firesteel
Dakota perspectives on the processes of change and maintenance in Dakota society; role of cultural traditions in the lives of the Dakota.

AmIn 3111. American Indian History: Mid-15th Century to 1850. (4 cr, §Hist 3871) O’Brien
Colonization and survival of North American Indians from rise of ancient American Indian civilizations to beginnings of reservation era.

AmIn 3112. American Indian History: 1850 to Present. (4 cr, §Hist 3872) O’Brien
American Indian communities from reservation era to present, emphasizing impact of federal Indian policy.

AmIn 3116. American Indian Literature. (4 cr) Miller
Comparative studies of oral tradition and modern literature from a variety of tribal cultures.

AmIn 3121. History of American Indian Education. (4 cr; prereq 3111, 3112 or #)
American Indian education in the United States; emphasis on educational systems established by the Indian peoples.

AmIn 3211. American Indian Philosophies. (4 cr)
Common themes in worldviews and philosophies of Indian peoples. Emphasis on the Dakota or Ojibwe.

AmIn 3221. Contemporary American Indian Art. (4 cr)
Works of selected contemporary American Indian artists and the media in which they work. Project.

AmIn 3242. Survey of American Indian Arts. (4 cr) Libertus
Visual arts and crafts of a variety of American Indian cultures; tribal values and worldviews as they shape the creative process and product.

AmIn 3810. Field Practice in Indian Studies. (3-9 cr; prereq soph or jr or sr, #, ∆)
Primarily for upper division majors and American Indian students. Opportunities for experiential learning in a variety of American Indian community settings. Consult with department faculty at least one term before enrolling.

AmIn 3960. Topics in American Indian Studies. (Cr ar)
Topics, which vary quarterly, not covered in the regular curriculum. Check with the department office for upcoming offerings.

AmIn 3970. Directed Studies. (1-15 cr; prereq #, ∆)
Individually arranged study, instruction, or research with faculty to meet student needs and interests.

AmIn 3980. Directed Instruction. (5 cr; prereq #)
For description, see AmIn 3970.

AmIn 5251. American Indians and the Cinema. (4 cr, §AmSt 5251)
Role of Hollywood in shaping images of Indians and the teaching of their “history and culture.” Films created by Indian filmmakers and their treatment of Indian themes and issues.

AmIn 5341. Contemporary Indian Movements. (4 cr)
American Indian Movement; National Congress of American Indians; “pan-Indian” movements, as well as those focused on more localized actions, such as fishing and treaty rights, environmental racism, and the appropriation of tribal names and symbols for sports teams.

AmIn 5411. Urban Indian Communities. (4 cr)
Factors contributing to the movement of Indian people into urban areas following WWII. Contemporary urban Indian issues (e.g., health, social services, housing, employment).

AmIn 5920. Senior Seminar. (2 cr; prereq AmIn major)
Topics vary.

AmIn 5960. Topics in American Indian Studies. (Cr ar)
For description, see AmIn 3960; graduate credit is arranged.
American Studies (AmSt)

Staff—Chair, David Roediger, 104 Scott Hall; Director of Graduate Studies, Riv-Ellen Prell; Director of Undergraduate Studies, Carol Miller

Professors: Delattre, E. May (on leave 1996-97), D. Noble, Yates

Associate Professors: L. May (on leave 1996-97), C. Miller, Prell

Assistant Professors: Child, Johnson

Adjunct Faculty—Professors: Aminzade (Sociology), Bagley (Social, Psychological, and Philosophic Foundations of Education), Bales (English), Ball (Political Science), Berman (History), Born (Health Ecology, American Indian Studies), Brauer (History), Clemence (Architecture and Landscape Architecture), Dicken-Garcia (Journalism and Mass Communication), Dobbert (Social, Psychological, and Philosophical Foundations of Education), Evans (History and Center for Advanced Feminist Studies), Furia (English), Gersmehl (Geography), Griffin (English), Hoyle (Children’s Literature Research Collection), Kohlstedt (History of Science and Technology), Laslett (Sociology), Leppert (Cultural Studies and Comparative Literature), Marling (Art History), McNaron (English), Menard (History), Murphy (History), Rabinowitz (English), Roth (English), Ruggles (History), Sarles (Anthropology), Stekert (English), Steuwer (Physics and History of Science and Technology), Sykes (Speech-Communication), Vecoli (History), Zipes (German)

Associate Professors: Archer (Cultural Studies and Comparative Literature), Brewer (Afro-American Studies), Damon (English), Dietz (Political Science), Dolan (Philosophy), Geffen (English), Green (History), Kane (Kinesiology and Leisure Studies), Krothe (Kinesiology and Leisure Studies), Martin (Geography and Urban Studies), O’Connell (Spanish and Portuguese), R. Miller (Geography), G. Noble (General College), Roberts (Journalism and Mass Communication), Rojas (Chicano Studies), Scanlan (Rhetoric), Silberman (Art History), Spear (History), Valdés (History and Chicano Studies), J. Wright (English and Afro-American and African Studies), Zita (Women’s Studies)

Assistant Professors: Norling (History), O’Brien-Kehoe (History and American Indian Studies), Pierce (Sociology)

Fellows: Beyer (Student Academic Support Services), Boston (Student Development and Athletics), Boyle (Humphrey Institute of Public Affairs), Sheehy (Weisman Museum)

The program in American studies enables students to explore the major issues and problems of American society through a multidisciplinary examination of the arts, history, politics, and literature of the diverse peoples of the United States.

Study Abroad—Knowledge of at least one other culture in some depth is indispensable to understanding our own, and students are strongly encouraged to incorporate an overseas study experience into their degree program. Appropriate credits from such study easily can be applied toward an American studies major or minor. Among the many study abroad opportunities is a reciprocal exchange program in American studies with England’s University of Essex. For information on options and procedures, see Foreign Study.

B.A. Major Sequence

Required Preparatory Courses—12 cr from 1001, 1002, 1003, 3111, 3112, 3113

Major Requirements—44 cr from 3xxx or 5xxx courses approved by major adviser, 8 to 12 in each of four fields: American history, American literature, American art and philosophy, social sciences in the United States. All courses must be taken A-F. A list of approved courses and a

Symbols and abbreviations: f.w.s.su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ∆—Approval of the instructor is required for registration / H—Honors course (follows the course number) /—In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
brochure describing the program are available in the program office, 104 Scott Hall.
3299, 3301-3302-3303 (Proseminars: American Studies)
12 cr in courses dealing with foreign civilizations chosen in consultation with major adviser

B. A. Minor Sequence

Minor Requirements—20 cr from 3xxx or 5xxx courses with A-F grading.

AmSt 1001, 1002, 1003. American Cultures. (4 cr per qtr)
Interdisciplinary study examining class, gender, public policy, and social issues by comparing the cultures and artistic expression of at least three of the following groups: European American, African American, American Indian, Asian American, and Chicano and Latino. 1001: to mid-19th century. 1002: Mid-19th century to the 1920s. 1003: 1920s to the present.

AmSt 3111. Creative Americans and Their Worlds. (4 cr)
The cultural life of Americans through study of works and lives of selected artists in several media, including painting, literature, architecture, music, and drama.

AmSt 3112. American Everyday Life. (4 cr)
Cultural formation and expression of experience among Americans through study of common population and consumer patterns, family life, work, and leisure activities.

AmSt 3113. American Cultural Diversity. (4 cr)
The cultural expression, values, and lifestyles of America’s many peoples, including minority and majority cultures.

AmSt 3114. America in International Perspective. (4 cr)
In three interrelated segments, the course explores foreign perspectives on institutions and values of the United States; examines the interaction among European settlers, later immigrants, and minorities in distinct regions; surveys the impact of America on foreign countries.

AmSt 3251, 3252, 3253. American Popular Culture. (4 cr per qtr)

AmSt 3299. Proseminar: American Studies. (4 cr)
Exploration of the classic works in American studies.

AmSt 3301-3302-3303. Proseminar: American Studies. (4 cr per qtr; prereq AmSt sr)
Each quarter covers a problem related to a representative theme, figure, or period. Students research and write senior theses.

AmSt 3920. Topics in American Studies. (4 cr per qtr [12 cr max]; prereq jr or sr)
Topics specified in Class Schedule.

AmSt 3970. Directed Studies. (1-15 cr per qtr)
Guided individual reading or study.

AmSt 5101, 5102. Religion and American Culture. (4 cr per qtr) Delattre
Representative profile of past and present religion in America organized around a theme or problem.

AmSt 5920. Topics in American Studies. (2-6 cr per qtr [12 cr max]; prereq #)
Topics specified in Class Schedule.

Ancient Near Eastern Studies

See Classical and Near Eastern studies.

Anthropology (Anth)

Staff—Chair, Gloria Goodwin Raheja, 200 Ford Hall; Director of Undergraduate Studies, Kathleen Barlow

Professors Emeriti: Murrill, Ogan, Rowe

Professors: Gerlach, Gibbon, Gudeman, Ingham, Miller, Wells

Associate Professors: Dunnigan, Lipset, Penn, Raheja, Spector

Assistant Professors: Barlow, Josephides, McCorriston

Lecturer: Arnold

Anthropology is the study of human beings and their ways of life, past and present. An understanding of the social practices, expressive forms, languages, and prehistoric pasts of many societies encourages appreciation of our common humanity and cultural differences, as well as critical perspectives on our own attitudes and values.

General Education—1101 and 1102, dealing with human culture in all times and places, are especially appropriate for general and liberal education. 3131, 5131, 5141, 5151, 5161, and all ethnography and archaeology courses in cross-cultural studies are appropriate for the nonmajor.

Study Abroad—Majors and minors are urged to begin acquiring functional skills in a second language early so that they can complement their anthropological studies by participating in an overseas field study program or some other study abroad program that offers an intensive exposure to other cultures. For information on options and procedures, see Foreign Study.
ANTHROPOLOGY

B.A. Major Sequence

Required Preparatory Courses—1101, 1102

Major Requirements—37 credits

3111 and 3201 (3366 may be substituted for either), 5201 or 5301

Major project: 5960 or 5961

Five electives from 3xxx and 5xxx courses, at least two of which must be 5xxx (One from each of the groups: Approaches to Anthropology, Ethnographic and Regional Studies, Institutions and Issues. Directed studies may count up to 8 cr max.)

All required courses must be passed with a grade of C or better. No S-N courses may count toward fulfilling the major or minor requirements.

Minor Sequence

Required Preparatory Courses—1101 or 1102 (both are strongly recommended)

Minor Requirements—Four 4-cr courses that have a common focus. Course selections must be approved by the director of undergraduate studies or the undergraduate adviser.

Introductory

Anth 1101f,w,s,su. Human Origins. (5 cr)
World prehistory as investigated by anthropologists. Methods and concepts used by anthropologists to study prehistoric human biological and cultural development.

Anth 1101Hf,w,s. Honors Course: Human Origins. (5 cr; prereq B avg or #)
For description, see Anth 1101.

Anth 1102f,w,s,su. Understanding Cultures. (5 cr, §1102; prereq jr or #)
Introduction to social and cultural anthropology. Comparative study of societies and cultures around the world. Topics include adaptive strategies; economic processes in society; kinship, marriage and gender; social stratification; politics and conflicts; religion and ritual; personality and culture.

Anth 1102Hf,w,s. Honors Course: Understanding Cultures. (5 cr; prereq B avg or #)
Theories and concepts of social and cultural anthropology as described for 1102 above, based on in-depth analyses of ethnographic accounts.

Anth 3003. The Rise of Civilization. (4 cr)
Beginnings of agriculture and emergence of world civilizations. Development of state societies from an archaeological perspective.

Anth 3005. Interaction and Civilization in Early Eurasia. (5 cr)
Archaeology of the Near East and temperate Europe, linked by the Mediterranean Basin. Development of societies and technologies and interactions on local, regional, and interregional levels. Lab sessions present material culture from both regions and introduce analytical methodologies.

Anth 3111. Introduction to Archaeology. (5 cr)
Fundamentals of archaeological field and lab analysis.

Anth 5102. Principles of Cultural Anthropology. (4 cr, §1102; prereq jr or #)

Special Topics

Anth 3960. Anthropology Proseminar. (4 cr; prereq #)
Topics vary according to staff interests and student suggestions. Focus on significant theoretical problems.

Anth 3970. Directed Studies. (Cr ar; prereq #)
Guided individual reading or study.

Anth 3980. Directed Instruction. (1-5 cr; prereq #)
Teaching seminar for undergraduates assisting in instruction of introductory anthropology courses.

Anth 3992H. Honors Tutorial. (1 cr; cannot be applied toward any CLA degree)
Program and project planning. Evaluation of work to date; planning future coursework and, particularly, developing a prospectus for senior research project. Normally completed at least three quarters before graduation.

Anth 5910, 5920. Topics in Anthropology. (Cr ar)
Special courses in all branches of anthropology. Topics specified in Class Schedule.

Anth 5960. Anthropology Proseminar. (4 cr; prereq sr Anth major)
Research seminar. Topics vary according to staff and student interests.

Anth 5961. Senior Research Project. (4 cr; prereq sr Anth major, #)
Independent research project fulfilling the senior option; directed by a faculty member.

Anth 5970. Directed Readings. (2-4 cr; prereq #)
Qualified students may register for work on tutorial basis.

Symbols and abbreviations: f,w,s,su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / #—Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / UC—University College (formerly CEE)
### MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

#### Approaches to Anthropology

**Anth 3201. Approaches in Cultural Anthropology.** (4 cr; prereq 1102 or #)
Contemporary perspectives on culture and ethnography.

**Anth 3303. Women: Anthropological Perspectives.** (4 cr)
Cross-cultural, comparative study of women and gender. Theoretical and methodological approaches in anthropology to the study of gender.

**Anth 3366. Language and Social Analysis.** (5 cr; prereq 1102 or 5102 or #)
Social structure and process through language; field observation emphasized. Some knowledge of descriptive linguistics useful but not required.

**Anth 3376. Field Research in Archaeology.** (2-10 cr; prereq 1101 or #)
Archaeological field excavation, survey, and research in prehistoric sites in Minnesota. Excavation techniques, recording analysis, and interpretation of archaeological materials.

**Anth 3377. Laboratory Techniques in Archaeology.** (4 cr; prereq 3376 or #)
Artifact analysis, preservation, cartography, photography, faunal and floral analysis, writing of site reports.

**Anth 5104. History of Anthropology.** (4 cr; prereq 1102, 15 cr in 3xxx or 5xxx courses)
Principal themes in 19th- and 20th-century anthropological thought—diffusionism, the autonomy of culture, evolutionism, and emerging methodological viewpoints (i.e., functionalism, structuralism, cultural materialism, and interpretivism). Is there a logic of anthropological inquiry?

**Anth 5191. Folklore, Power, and Cultural Description.** (4 cr; prereq 1102 or 5102 or #)
Song, oral poetry, story, and other performed speech genres as sites of cultural contestation in the areas of gender, class, and colonial relations. The politics of expressive forms in contemporary and colonial societies, and implications for the practice of ethnography.

**Anth 5201. Contemporary Perspectives in Anthropology.** (4 cr)
Contemporary theoretical perspectives in cultural anthropology and their historical background. Modernism, reconceptualizations resulting from postmodern and feminist critiques of fieldwork and ethnographic writing, with applications to contemporary U.S. cultural diversity.

**Anth 5301. Advanced Method and Theory in Archaeology.** (4 cr; prereq 3111 or #)
Advanced survey and in-depth discussion of past and contemporary archaeological, theoretical, and methodological issues and approaches. Series of projects incorporating theories and methods, including simple computer analysis. Recommended for anthropology majors specializing in archaeology.

**Anth 5305. Studies in Ethnographic Classics.** (5 cr)
Notable theoretical and ethnographic works in the history of anthropology. Topics and works vary yearly.

**Anth 5331. Culture Theory: An Introduction.** (4 cr; prereq jr or sr or grad or #)
Selected issues in the development of culture theory, e.g., do cultural phenomena have an independent reality or are they derived from social systems?

**Anth 5392. Philosophical Anthropology.** (4 cr; prereq 1102 or 5102)
Survey of a cluster of traditional problems associated with major views on human nature and culture. Variations on these views and specific arguments of relativists, phenomenologists, behaviorists. Recent ethnographic theory.

**Anth 5394. Phenomenology and Ethnography.** (4 cr, §Hum 5398)
Phenomenological/existentialist thought conceived as “the end of ideology”; its politicization during World War II; its use in reflexive anthropology conscious of its own colonial foundations; its use in attempts to understand “The Other” and concepts of the person.

**Anth 5520. Current Issues in Archaeology.** (4 cr; prereq 3111 or #)
Discussion/review/analysis of specific current theoretical and/or methodological issues in archaeology.

**Anth 5524. Archaeological Research Design.** (4 cr; prereq jr or sr Anth major, 12 cr upper div archaeology coursework or #)
Recommended for anthropology majors specializing in archaeology who select senior project option. Background research, techniques, methods, and concepts for senior research project. Development of annotated bibliography and detailed research proposal.

**Anth 5592. History of Archaeology.** (4 cr; prereq 12 cr in 3xxx or 5xxx Anth courses)
Survey of the history of archaeology with emphasis on the development of major concepts and research goals.

#### Ethnographic/Regional Studies

**Anth 3211. Native Peoples of North America.** (4 cr)
Aboriginal cultures of native North America. Effects of culture contact.

**Anth 3212. Indians of the Greater Southwest.** (4 cr)
Cultures and histories of Indian peoples in the southwestern United States and northwestern Mexico.

**Anth 3222. Peoples of the Greater Southwest.** (4 cr, §LAS 3222)
Indigenous and mestizo cultures of Mexico, Guatemala, Belize, and Honduras. The traditional rural community and modernization, urbanization, and religious conversion.

**Anth 3224. Hispanic Cultures of Latin America.** (4 cr; prereq 1102 or #)
Examine data from Mexico to South America. Topics such as the economy, family, gender, religion, and ideology. Several conceptual frameworks used including structural, symbolic and cultural interpretations, history, and impact of colonialism.
Anth 3241. Peoples and Cultures of Africa. (4 cr, §Afro 3501)
Key aspects of society, culture, and ecological adaptation of African people south of the Sahara. Aesthetic expression, social, economic, political, and religious systems. Theoretical problems in African anthropology.

Anth 3261. Indian Culture and Society. (4 cr)
Survey of broad South Asian civilization patterns and ethnographic contexts; theoretical issues in forming South Asian anthropology. Caste, sovereignty, and polity; person and society; kinship, marriage, and gender; ritual; colonial discourse and transformations.

Anth 3293. Peoples and Cultures of the Pacific Islands. (4 cr)
Geography, prehistory, and Western exploration of Pacific island peoples, from Hawaii to Papua New Guinea. Topics in regional ethnography. Relationship of Pacific cultures to major problems in anthropological thought.

Anth 3294. The Contemporary Pacific. (4 cr; prereq 3293 or #)
Life in 20th-century Pacific Island societies. Effects on and perceptions of colonialism and the world system by islanders: political and economic development, the post colonial state, ethnicity and emigration. Changes in the status of women, expressive culture, psychosocial adjustment, and religion.

Anth 3371. Archaeology of Prehistoric Europe. (4 cr, §5120, §AnSt 5120)
Early development of non-Mediterranean European society from Old Stone Age through Iron Age to the Roman Period, based on archaeological evidence. Principal transformations of European culture with introduction of agriculture, development of metallurgy and trade, and emergence of towns and cities.

Anth 3511. Archaeology of Native Americans. (4 cr; prereq 1101 or #)
Prehistoric and early archaeology of American Indians north of Mexico.

Anth 5120. Origins of European Civilization. (4 cr, §3371, §AnSt 5120)
Early development of European society, from Old Stone Age to Roman Period. Special attention to principal transformations of European culture with introduction of agriculture, development of metallurgy and trade, and emergence of towns and cities.

Anth 5178. Archaeology of Northern Europe. (4 cr, §AnSt 5178; prereq 1101, 3003 or 3371 or #; UC only)
Archaeology of Scandinavia, northern Germany, and neighboring regions in the Bronze and Iron Ages and the Roman and Migration Periods. Trade, growth of towns, and changing art, ritual, and religion.

Anth 5325. Gender and Power in South Asia. (4 cr; prereq 1102, 3261 or 5102 or #)
Multiple perspectives on gender, power, kinship, and sexuality in South Asian society and the theoretical issues this poses for ethnographic writing. Focus on textual traditions, folklore, ritual and exchange, and the politics of everyday life, colonialism, and post-colonialism.

Anth 5258. Anthropological Analysis of American Culture. (4 cr; prereq 1102 or 5102 or #)
Anthropological perspectives on contemporary American culture and society; values, family organization, socialization and kinship, education, and community integration.

Anth 5461. North American Indian Architecture. (4 cr, §Arch 5461)
Historic and contemporary principles and theories. Study of culture, technology, environment, and art and craft of North American Indians in their settlements and architecture.

Human Institutions
Anth 3131. Religion and Culture. (4 cr; prereq 1102 or #)

Anth 5112. Gender and Kinship. (4 cr; prereq 1102 or 5102, 3201, or #)
Gender, sexuality, marriage, and kinship in cross-cultural perspective. Role of kinship studies in anthropological theory, including contemporary feminist critiques.

Anth 5114. Structural and Semiotic Anthropology. (4 cr; prereq 1102 or 5102, 3201 or #)
Assumptions, methods, and problems of structural and semiotic anthropology; theory and analysis of kinship, myth, and social organization.

Anth 5115. Economic Anthropology. (4 cr; prereq 1102 or 5102, 3201 or #)
Systems of production and distribution, especially in nonindustrial societies. Comparison, history, and critique of major theories in the field; development of an anthropological approach to facts and processes of the economy in other societies and our own.

Anth 5118. Political Anthropology. (4 cr; prereq 1102 or 5102 or #)
Anthropological approaches to politics: the structural-functionalists, Manchester school, others. Key political concepts: authority, legitimacy, power, ideology, order, and conflict. How symbols and ritual shape political processes. Symbolic dimensions of ethnic and class consciousness.

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Anth 5121. Anthropology of Law. (4 cr; prereq 1102 or 5102 [waived for majors in political science and law])
Theory and method of various legal systems. Cultural background of law and relation of law to society. Functions and evolution of law in cultures ranging from small-scale to complex.

Anth 5131. Anthropology of Religion. (4 cr; prereq 1102 or 5102 or #)
Comparative study of beliefs, myths, and rituals in folk and indigenous religions. Integration of religion and social relations.

Anth 5132. Symbolic Anthropology. (4 cr; prereq 1102 or 5102 or #)
Introduction to semiotic or symbolic interpretation of cultures in anthropology. Problems in theory and method; structure and motivation of cultural symbolism in particular societies.

Anth 5145. Anthropology and Education. (4 cr, §SPFE 5171; prereq 1102 or 5102 or #)
Cross-cultural perspectives on educational patterns; implicit and explicit cultural assumptions. Methods and approaches to cross-cultural studies in education.

Anth 5151. Cultural Change and Development. (4 cr; prereq 1102 or 5102 or #)
Processes of cultural change: invention, innovation, diffusion, and acculturation. Theories of modernization, dependency, and world-systems. Roles of anthropologists in development programs.

Anth 5152. Anthropology of Social Movements. (4 cr)
Cross-cultural study of the nature, process, and function of social, political, and religious movements of change. Theories and case studies, including Christianity and Islam, Asia, Africa, and United States.

Anth 5153. Urban Anthropology. (4 cr; prereq 1102 or 5102 #)
Structure and process in non-Western urban centers; the role of rural migrants, relationship of urbanism to political and economic development, role of voluntary associations, adjustment of kinship groups to urban life.

Anth 5154. Anthropology of Colonialism. (4 cr; prereq 1102 or 5102 or #)
Social, structural, symbolic, and psychological aspects of societies of colonizers and the colonized; emphasis on South Asia, Oceania, and Puerto Rico.

Anth 5156. Culture and Comparative Politics. (4 cr; prereq 1102 or #)
Theoretical analyses and comparative case studies illustrating how aspects of culture influence political behavior in society.

Anth 5157. The Political Discourse of Social Change. (4 cr)
Tension between tradition and innovation of ideas, techniques, and material development in contexts of rapid social change, especially when local cultures come into contact with outside, politically more forceful ones. Tradition as an already politicized discourse.

Anth 5161. Cultural Semantics. (4 cr; prereq #)
Language-based approaches to the study of cultures.

Anth 5141. Psychological Anthropology. (4 cr; prereq 1102 or 5102 or # [waived for majors in public health, nursing, psychology, sociology, and social work])
Self, emotion, cognitive processes, and child development in cross-cultural perspective.

Human Environments: Natural and Cultural

Anth 3116. Ecological Anthropology. (4 cr, §5116; prereq 1102)
How humans interact with biophysical environment through nature. Cross-cultural comparative study of ways of making a living: foraging, herding, farming, industrial, etc.; correlating environment with technology, economy, social and political organization, religion. Resource controversies and global environmental change.

Anth 5116. Ecological Anthropology. (4 cr, §3116; prereq 1102)
How humans interact with biophysical environment through nature. Cross-cultural comparative study of ways of making a living (e.g., foraging, herding, farming, industry); correlating environment with technology, economy, social and political organization, religion. Resource controversies and global environmental change.

Anth 5117. Natural Resources Anthropology. (4 cr)
Employment of a cultural ecological and systems approach to examine ways in which social institutions and cultural concepts are applied and change across world societies to develop, use and manage key environmental resources. Comparative studies from contemporary and historical United States, western Europe, Africa, Asia, and the Caribbean.

Anth 5176. Environmental Archaeology. (4 cr; prereq 1101, 3111 or #)
Archaeological and natural-scientific approaches to the study of past human society with emphasis on use of the environment and reconstruction of past environmental conditions. Field and lab techniques in association with archaeological research problems.

Arabic
See Afro-American and African studies.

Aramaic
See Classical and Near Eastern studies.

Architecture (Arch)

College of Architecture and Landscape Architecture

Staff—Head, Garth Rockcastle, 110 Architecture; Director of Undergraduate Studies, Lance LaVine; Director of Graduate Studies, Julia Robinson
Proffers: Clemence, Grebner, LaVine, Robinson, Rockcastle, Satkowski, Stageberg, Morrish

Associate Professors: Anderson, Dittmar, Weeks

Assistant Professors: Guzowski, Jara, Piotrowski, Solommonson

Adjunct Professors: Mulfinger, Rauma, Thompson, Thorbeck

Adjunct Associate Professors: Meyer, Tollefson

Adjunct Assistant Professors: Abbott, Franck, Ladner, Nelson, Parker, Peterssen, Quigley, Rhoades, Scherer, Smith, Snow, Wilkins

Lecturers: Blanski, Dimond, Dozier, Fuller, Herzog, James, LaDouceur, Lammers, Lew, Potts, Searls, Weiner, Wentzel

The Department of Architecture provides in-depth instruction in history, representation, design, theory and design practice emphasizing the development of architecture as a language of form, space and order. The study of architecture examines the methods, values, precedents and material reality characteristic of the process of shaping the natural and built environments. The major combines core prerequisites with a broad introduction to the field of architecture including required courses in representation, history, theory and design processes and an individualized program planned by the student with the assistance of an adviser.

The B.A. provides a general education as well as preparation for a professional graduate degree in architecture. It may also be used as preprofessional preparation to continue graduate study in related fields or employment in fields of environmental/community design, fine arts, government, private development, or construction. The aim of the undergraduate major is to establish a strong design foundation that serves a diversity of careers, and to provide flexibility as individual opportunities change. This degree is not a sufficient credential to practice architecture.

General Education—The following courses are recommended for general audiences and are required for the major: Arch 1401, 1601, 3411, 3412, and upper division 54xx history courses. These courses do not require major designation as long as the prerequisites have been met.

Grades—All courses, whether required or elective, to be applied toward the major must be taken A-F and grades of C or better earned. The requirements in math, physics, composition and speech must also be taken A-F.

Study Abroad—The department encourages majors to incorporate a study abroad experience into their undergraduate program. Appropriate credits from such study can be applied toward elective requirements in the major. Information on study abroad options and procedures is available from the Department of Architecture director of undergraduate studies, 110 Architecture Building, and the Foreign Study section of this bulletin.

B.A. Major Sequence

The B.A. degree consists of two years of pre-architecture study followed by two years of coursework after acceptance to the major. Application to the major is made after completion of the 90 credits of prerequisite coursework by filing a Major Program Form with the Department of Architecture. There are three application dates in each academic year—November 1, February 1, and April 1. Students are admitted based on space availability and an academic record that has maintained a GPA of 2.50 overall as well as in any architecture courses taken. Students are required to maintain a portfolio of originals or duplications of all freehand drawings, projects and architecture studio designs during their studies, since a portfolio is required for submission to the graduate professional degree. All majors complete their senior project in Arch 5283.

Required Preparatory Courses in Architecture—1301, 1401, 1601

Other Required Preparatory—The following courses outside the major must be completed or in progress at the time of application to the major: Comp 1011, one speech/creative writing course, Math 1142 (or equivalent calculus courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / ∆—Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / ∆—Approval of the college offering the course is required for registration / H—Honors course (follows the course number) / —In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
course), one art course, Phys 1041, 1042 (or equivalent sequence), and half of the two-year requirement for the second language.

Students should complete as many of the Twin Cities campus liberal education requirements as possible before applying to the major. Consult the CALA Student Services Office, 110 Architecture Building, concerning recommended liberal education courses and additional preprofessional requirements.

Major Requirements—At least 46 credits in 3xxx-5xxx architecture courses, including required and elective courses, plus an elective concentration outside the major. Eight required architecture courses (38 credits): 3311, 3411, 3412, 3501, 5281, 5282, 5283, and one upper division history course, 54xx.

Two 3xxx/5xxx electives in either architecture or landscape architecture (8 credits): choose from Arch 53xx, Arch 54xx, Arch 544x, Arch 55xx (excludes 5351, 5352, 5411, 5413), or LA 3413, LA 55xx.

Elective concentration outside the major (20-28 credits): Candidates for the bachelor’s degree develop either an elective concentration outside the major (20-28 credits at 3xxx/5xxx level) or a minor as a means to broaden the social, cultural and international aspects of design. These courses may also provide preparation for careers or graduate study in fields other than architecture as well as graduate study in the professional master’s in architecture program (M.Arch.). Selection of courses, which ideally begins at the sophomore level, may take the form of a declared minor such as art history, ecology, anthropology, comparative literature and cultural studies, political science, or selected courses in various disciplines that impact design decisions, such as geography, women’s studies, natural resources, economics, housing, management, or political science.

The development of an academic program and selection of specific courses are the responsibility of the individual student but consultation with a CLA adviser and an architecture adviser is strongly encouraged. The concentration or minor must be developed and presented clearly by the candidate at the time of the application to the major because it becomes an integral part of the student’s major program form. As individual goals change, the approved concentration can be revised by departmental consultation and amendments can be made to the major program form.

Accelerated Professional Degree Program—Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.A. and the M.Arch in six years rather than seven. Applicants for accelerated status must complete all B.A. degree requirements before their senior year, with the exception of no more than two courses in either the elective concentration or minor and any liberal education requirements. With accelerated status, students complete the first year of the professional degree program in their senior year; courses carry CLA upper division credit. Accelerated status is limited to 10 students per year and does not admit students to the graduate school professional degree program. Separate requirements, such as the Graduate Record Examination (GRE), must be submitted in January of the desired year of admission. Students may inquire about accelerated status with the Department of Architecture’s director of undergraduate studies, 110 Architecture Building.

To be considered for accelerated status, students must be enrolled at the University of Minnesota as a B.A. in architecture major; have completed one year of Arch 5281, 5282, 5283; completed 135 credits; have an overall GPA of 3.20 or higher; and complete an interview with the director of undergraduate studies by June 1 of their junior year.

Nonmajors, students with B.A. or B.S. degrees in disciplines other than architecture who are preparing for admission to the graduate professional degree program, and first-quarter transfer students are not eligible for accelerated status.

Accelerated program (42 credits in architecture)—5291, 5292, 5293, 5309, 5401, 5511, 5531, 5541, 5711

General

Arch 1301. Introduction to Architectural Drawing. (4 cr, §LA 1301)
Beginning drawing course that emphasizes visualization and drawing of form and space in the physical environment. Basic elements of form using design drawing systems and conventions. Developing skills in visual literacy and expression through drawing.

Arch 1401. The Designed Environment. (4 cr, §LA 1401)
Principles and traditions within the design disciplines of architecture, landscape architecture and urban design, along with references in the arts, sciences, and literature, will be explored in this review of the formal constructs of the designed environment.
Arch 1601. Design Professions and Society. (4 cr) Issues and roles citizens, civic structures, entrepreneurs, clients, and design professions address in the process of shaping, constructing, and managing the physical environment. Planning procedures, policy creation and decision-making strategies used in formulating projects intended to maintain an aesthetic, ecologically functional, and equitable physical environment.

Design

Arch 5281. Architecture Studio I: Fundamentals of Space and Form. (6 cr; prereq 3311, 3412; Arch major or #) Elements of architecture, qualities of space, principles of design and systems of order found in everyday objects, experiences and forms of nature. Application of visual tools, such as models, drawings and graphics, and design principles to three-dimensional form and composition. Lecture, critique, and small problems.

Arch 5282. Architecture Studio II: Structure and Order. (6 cr; prereq 3311, 3412, 5281, Arch major or #) Design methods in the conception of architectural form and space within the context of cultural and technological conditions of our time. Application of design processes in developing understandings of the relationship between architecture and meaning. Lecture, design projects and critiques.

Arch 5283. Architecture Studio III: Site, Context, and Form. (6 cr; prereq 5282, Arch major or #) Development of architectural form and space within the context of a specific site and building program. Exploration of materials and structure systems within the context of increasingly complex design projects. Lecture, design projects, and critiques.

Arch 5250. Topics in Architecture Design. (Cr ar [1-6]; prereq 5283 or Arch grad) Special topics in the design of architecture.

Representation and Communication

Arch 3311. Drawing for Design. (4 cr, §LA 3311; prereq 1301, pre-Arch or Arch or BED or LA major or #) Drawing processes as modes of perception, cognition and reflection. Representational aspects of drawing systems and conventions. Development of understanding of space, light, and order.

Arch 5309. Representation in Architecture. (4 cr, §3033; prereq 3311, Arch/BED or LA grad or #) Historical and theoretical study of representation and its depiction in architecture and landscape architecture. Exploration of media, conventions and techniques used to visualize or reproduce architecture and how they affect the “production” of ideas.

Arch 5313. Visual Communication Techniques in Architecture. (4 cr, §3033; prereq 3311, Arch/BED major or #) Delineation, presentation, and design techniques. Various visual media and methods of investigation.

Arch 5321. Architecture in Watercolor. (4 cr, §3110; prereq 3311, Arch/BED major or #) Watercolor as representation and communication in the design process. Foundation principles, techniques, medium, tools and materials. Exploration of color relationships, mixing, composition and applications to design.

Arch 5350. Topics in Architectural Representation. (Cr ar; prereq Arch major or Arch grad or #) Special topics in theory and practice of visual representation in architecture.

Arch 5381. Introduction to Computer Aids for Architectural Design. (4 cr; Arch or BED or LA major; A-F only) Electronic design media, including document design, 2D drawing, 3D modeling and animation, printing, and plotting. Electronic networking and communications.

Arch 5382. Computer Aids for Architectural Design. (4 cr; Arch or BED or LA major; A-F only) Understanding computer-aided tools used in design and practice, including database management, spreadsheet analysis, land use analysis, 2D/3D CAD, image manipulation, and project management.

Arch 5383. Advanced CAD Visualization for Architecture. (4 cr; Arch or BED or LA major; A-F only) Advanced multimedia visualization techniques for architecture design and presentation, including solid modeling, photo-realistic imaging, animation, and video recording and editing.

History

Arch 3411. History of Architecture to 1750. (4 cr, §ArtH 3411, §LArch 3411) History of architecture and city planning from antiquity to 1750, as illustrated by major monuments from Western and non-Western cultures.

Arch 3412. History of Architecture Since 1750. (4 cr, §ArtH 3412, §LArch 3412) History of the major monuments, concepts, and theories of urbanism and architecture since 1750.

Arch 5410. Topics in Architectural History. (Cr ar; prereq #) Advanced study in architectural history. Readings, research, seminar reports.

Symbols and abbreviations: f, w, s, su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / $—Credit will not be granted if credit has been received for the course listed after this symbol / $—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / #—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / —In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
Arch 5417. Asian Architecture. (4 cr, §5057, §ArtH 5417; prereq Arch major or #)
Selected topics from the history of architecture and urban design in West, South and East Asia.

Arch 5418. Indigenous Architecture. (4 cr, §5058, §ArtH 5418; prereq Arch major or #)
Case studies of indigenous environments in selected cultures.

Arch 5421. Ancient Architecture. (4 cr, §5051, §ArtH 5421; prereq 3411, Arch major or #)
History of development of architecture and urban design in Egypt, Mesopotamia, Crete, Mycenae, and classical Greece and Rome until the advent of Christianity.

Arch 5422. Early Medieval Architecture. (4 cr, §5052, §ArtH 5422; prereq 3411 or Arch major or #)
History of the development of architecture and urban design during early Christian, Byzantine, Islamic, Carolingian, and Romanesque periods in the Near East and Western Europe until 1150 A.D.

Arch 5423. Gothic Architecture. (4 cr, §5053, §ArtH 5423; prereq 3411 or Arch major or #)
History of the development of architecture and urban design in Western Europe from 1150 until 1400 A.D.

Arch 5424. Renaissance Architecture in Italy. (4 cr, §5054, §ArtH 5424; prereq 3411, Arch major or #)
History of architecture and urban design in Italy, 1400-1600. Emphasis on major figures (Brunelleschi, Alberti, Bramante, Palladio) and the evolution of major cities (Rome, Florence, Venice).

Arch 5425. Baroque Architecture in Italy. (4 cr, §5064, §ArtH 5425; prereq Arch major or #)
Architecture and urban design in Italy, 1600-1750. Emphasis on major figures (Bernini, Borromini, Cortona, Guarini) and the evolution of major cities (Rome, Turin).

Arch 5426. Architecture and Nature: 1500-1750. (4 cr; prereq 3411, 3412 or #)
History of the interaction of architecture and nature in Italy, England, and France in the 16th and 17th centuries. Major monuments, their relationship to theories of architecture and gardening, urban and rural life.

Arch 5431. 18th-Century Architecture and the Enlightenment. (4 cr, §5055, §ArtH 5431; prereq 3412 or Arch major or #)
Architecture, urban planning, and garden design in Europe, 1700-1850.

Arch 5432. Modern Architecture. (4 cr, §5056, §ArtH 5432; prereq 3412 or Arch major or #)
Architecture and urban design from early nineteenth century sources in Europe and America to World War II.

Arch 5434. Contemporary Architecture. (4 cr, §5063; prereq Arch major or #)
Developments, theories, movements, and trends in architecture and urban design from World War II to the present.

Arch 5439. History of Architectural Theory. (4 cr, §5067, §ArtH 5439; prereq 3412 or #)
History of architectural theory from antiquity to the 20th century.

Historic Preservation
Arch 5411. Historic Preservation Process. (4 cr, §5141; prereq Arch major or #)
Philosophy and theory of historic preservation, historic origins, descriptive analysis of buildings, building documentation, technology of building conservation, historical archaeology, economic considerations, preservation law, guidelines for preservation, neighborhood conservation, international preservation, and case studies of representative preservation projects.

Arch 5413. Historic Building Research and Documentation. (4 cr, §5143; prereq Arch major or #)
Philosophy, theory, and methods of historic building research, descriptive analysis of buildings, building documentation, historical archaeology, and architectural taxonomy.

Theory and Criticism
Arch 5401. Principles of Design Theory. (4 cr; prereq Arch grad or #)
Principles of design and their instrumentation. How and why architecture theory is generated. Types and significance of formal analysis. Theoretical positions and modes of criticism.

Arch 5450. Topics in Architecture Theory. (Cr ar; prereq Arch major or Arch grad or #)
Special topics in theory and criticism in architecture.

Arch 5454. Semiotics and Deconstruction in Architecture. (3 cr, §5854; prereq 5401, Arch grad or #)
Expressive and cultural dimensions of architecture, especially as they relate to linguistic analogies, knowledge production and contemporary philosophy, including a broad critical perspective of architectural discussion and argumentation which will address the current aspects of the debates.

Arch 5455. Typology and Architecture: Theories of Analysis and Synthesis. (3 cr, §5855; prereq 5401, Arch grad or #)
Theoretical traditions and development of the use of typology in architecture. Works of Laugier, Quatremere De Quincy, Viollet-Le-Duc, Ledoux, Durand, Camillo Sitte, and Le Corbusier. Recent developments and theoretical positions of the “neorationalist” and “contextual” arguments for contemporary applications of the idea of type.

Arch 5458. Architecture and Culture. (3 cr, §5951; prereq 3412, Arch major or #)
Architecture as a cultural medium; relation among architecture, people, and culture; physiological and symbolic messages; relation between research findings and design; relation between vernacular and high style architecture; reception theory in architecture; cultural critique and cultural change; implications for architectural practice.

Technology
Arch 3501. People, Ecology, and Design. (4 cr; prereq 3311, 3412, Arch major or #)
Issues, design procedures, and short- and long-term impacts of development decisions made by architects and landscape architects in terms of local and global ecological systems.
Arch 5511. Construction Materials in Architecture. (4 cr, §3061; prereq Arch grad or #)

Arch 5512. Historic Building Conservation. (4 cr, §5142; prereq Arch major or #)
Historic building systems, materials, and methods for their conservation; use of contemporary systems in historic buildings.

Arch 5541. Thermal Design in Architecture. (4 cr, §3064; prereq Arch major or Arch grad or #)
Thermal and climatic issues in the design of small and midsize buildings. Investigations in built and mechanical means to modify the climate. Evaluation of design techniques in terms of potential impacts on energy use, the environment, and architectural meaning.

Arch 5543. Climate and Architecture. (4 cr, §5957; prereq 5541, grad Arch or #)
Role of climate in architectural design and theory. Environmental and energy implications at the site, building, and component scales. Design projects explore graphic analysis, physical modeling, and quantitative assessment.

Arch 5550. Topics in Architecture Technology. (Cr ar; prereq Arch major or Arch grad or #)
Selected topics in architecture technology; construction, environmental management, energy performance, lighting, or materials.

Urban Design
Arch 5711. Design Principles of the Urban Landscape. (4 cr, §5137; prereq 1601, Arch or BED major or #)
Art and design of making city, neighborhood, and development plans. Public policies, planning tools and process, and physical models for design professionals and private and civic institutions to shape the physical environment.

Arch 5724. The Meaning of Place. (4 cr, §5956; §Geog 5856; prereq # A-F only)
Direct experience analyzing messages and meanings of surroundings. Explores what present-day environment reveals about the past and examines links between sense of places and feelings of well-being. Twin Cities central districts and selected neighborhoods as well as other settings inside and outside Minnesota.

Arch 5725. Housing and Values. (4 cr, §5953; prereq upper div or grad)
Meanings and values attached to housing in different cultures at various stages in the life cycle and in different climatic situations. Impact of housing heritage on housing choice, potential impact of emerging constraints (e.g., energy ability) on current and future housing decisions.

Arch 5750. Topics in Urban Design. (Cr ar, prereq 5711, Arch grad or #)
Special topics in theory and practice of urban design.

Area Studies Programs

Staff—Advising. 214 Social Sciences Building (612/624-8543)

Faculty—The Area Studies Programs faculty is drawn from humanities and social science disciplines in CLA, as well as from several of the professional schools and colleges. All are active in teaching and/or research in their area. For a complete list of area studies faculty, see the Area Studies Programs Handbook.

Area Studies Programs (ASP) oversee degree programs in East Asian studies, European area studies, Latin American studies, Russian area studies, and South Asian and Middle Eastern studies. A major in these degree programs is for students with an interest in studying a variety of issues related to a specific geographical area. In area studies, the student is not restricted to a single disciplinary perspective; rather, she or he can choose from a wide variety of classes and approaches to obtain a well-rounded view of a specific culture or a geographical area. ASP advises students and helps to match students with faculty, resources, and programs appropriate to their individual academic interests.

The curricular options and requirements for each of the degree programs are described in the Area Studies Programs Handbook, available in 214 Social Sciences Building.

All degree programs have the following requirements: successful completion of all premajor requirements; Area 3144—Scope and Methods of Area Studies and two other methods of
inquiry courses; a core set of breadth requirements; advanced proficiency in one modern foreign language; an area of concentration; and completion of Area 5504—Senior Project. In some cases, language competency in two foreign languages may be required. Students are encouraged to incorporate topical courses taught as part of the Foreign Language Immersion Program (FLIP) or Foreign Languages Across the Curriculum (FLAC) into their majors. These programs enable students to strengthen their language skills while studying subjects relevant to their degree program.

The structure of the South Asian and Middle Eastern studies major differs from the above and is described under the major later in this section.

An early start in planning a degree program in one of the area studies majors is strongly recommended. Students are encouraged to begin their premajor courses as soon as possible because of the substantial foreign language requirements and to ensure continuity in courses offered sequentially. For assistance in planning an area studies major, consult the program adviser in 214 Social Sciences Building.

Study Abroad—Students are encouraged to include a study abroad experience as part of their undergraduate career. Various study abroad opportunities are available and appropriate courses taken under such programs can be applied toward area studies major requirements. For general information on study abroad programs, contact the International Study and Travel Center in 102 Nicholson Hall. An approved list of area studies language substitution programs is available in 214 Social Sciences Building. See also the Foreign Study section of this bulletin.

Foreign Languages Across the Curriculum (FLAC)—Students are encouraged to include courses conducted in a language other than English as part of their undergraduate career, whether they are offered on campus or abroad. A variety of FLAC courses are offered for two or four credits, while others are offered for one credit in conjunction with four-credit courses taught in English. To date, FLAC courses have been taught in area studies, geography, history, international relations, political science, and sociology in Chinese, French, German, Italian, Japanese, Russian, Spanish, and the Scandinavian languages.

Each spring, several FLAC courses are offered in French, German, and Spanish, providing students the opportunity to take all their coursework in a number of disciplines in one of those languages for one quarter. This concentrated form of FLAC is called the Foreign Language Immersion Program (FLIP); participating in FLIP is especially beneficial for students preparing to study abroad or returning from a study abroad experience. For more information, consult the Area Studies Programs advisers in 214 Social Sciences Building.

Honors Program—Students who wish to consider participating in the honors program should contact the Area Studies Programs honors adviser in 214 Social Sciences Building.

Area Studies Courses—Most Area Studies Programs courses are drawn from CLA. Some courses are also offered through several of the professional colleges on the Twin Cities campus, such as the College of Natural Resources, the College of Human Ecology, and the Hubert H. Humphrey Institute of Public Affairs. Note: Most courses that fulfill major requirements are described under individual department listings in this bulletin. For a detailed list of courses that count toward area studies majors, consult the Area Studies Programs Handbook. Specific courses offered by Area Studies Programs include the following.

Area 3144. Scope and Methods of Area Studies. (4 cr; prereq soph, major or premajor or #) Scholarly traditions, research techniques, and theoretical frameworks characterizing interdisciplinary scholarship as it relates to regions of the world defined by geographic, political, cultural, linguistic, and ethnic areas.

Area 3910/5910. Topics in East Asian Studies. (2-4 cr) Description varies with topic title.

Area 3920/5920. Topics in European Studies. (2-4 cr) Description varies with topic title.

Area 3930/5930. Topics in Latin American Studies. (2-4 cr) Description varies with topic title.

Area 3940/5940. Topics in Middle Eastern Studies. (2-4 cr) Description varies with topic title.

Area 3950/5950. Topics in Russian Area Studies. (2-4 cr) Description varies with topic title.

Area 3960/5960. Topics in South Asian Studies. (2-4 cr) Description varies with topic title.
Area 3970/5970. Directed Studies. (1-15 cr; prereq #, ∆, Ω) Guided individual reading or study. Open to qualified students for one or more quarters.

Area 3990/5990. Directed Research. (1-15 cr; prereq #, ∆, Ω) Qualified students, with consent of instructor, work on a tutorial basis.

Area 5504/5504H. Senior Project. (4 cr; prereq sr in dept or #) Research methods, writing skills, and bibliography related to field of study.

East Asian Studies (EAS)
East Asian studies is concerned with the in-depth study of China, Japan, Korea, Taiwan, and Vietnam. As interaction between the United States and East Asia flourishes, knowledge and understanding of these societies is essential. Study of the history and language of the region provides students with a foundation for coursework in the concentration of their choice. Undergraduate major and minor programs are available in East Asian studies.

B.A. Major Sequence—
East Asian studies
Students are admitted to the East Asian studies major program upon successful completion of premajor requirements and formal enrollment in the major at the Area Studies Programs advising office (214 Social Sciences Building). All premajor and major courses must be taken A-F and completed with a grade of C or better.

Required Preparatory Courses
To be accepted into the major, students must meet the following requirements: minimum of 48 general credits and good standing in CLA; at least three quarters of East Asian language study (or equivalent, as determined by the relevant language department); and at least 12 credits (minimum 3 courses) of 1xxx or 3xxx coursework related to East Asia, of which one of the three courses must be EAS 1461, 1462, or 1463, while the remaining courses may be chosen from approved humanities or social sciences offerings.

Major Requirements
Language—The minimum foreign language requirements for the East Asian studies major may be fulfilled by successful completion of one of the following: (1) three years (total of 9 quarters) of a Chinese or Japanese language sequence; (2) at least six quarters of Chinese or Japanese language study and at least six quarters of language study in a second East Asian language; or (3) at least six quarters of Chinese or Japanese language study and an approved study abroad experience in East Asia. For a concentration with a Korean focus it is possible to have a comparable level of Korean in lieu of Chinese or Japanese requirements. (Note: Proficiency examinations and evaluations are provided by relevant language departments.)

Methods—A minimum of three courses (4 or 5 credits each) dealing specifically with approaches to and/or methods of scholarly inquiry must be completed. These courses include Area 3144—Scope and Methods of Area Studies, and two other approved courses in the social sciences, history, literature, or the humanities, depending upon the nature of the student’s major program.

Breadth—All majors must complete the following core set of courses (4 courses or a minimum of 16 credits): Geog 3211—Geography of East Asia; one 3xxx or 5xxx social science course; one course from the Hist 3461-3462-3463 East Asian survey sequence; and one 3xxx or 5xxx literature, humanities, cultural studies, music, or art history course focusing on East Asia (or on one East Asian society).

Concentration—All students in the program are required to develop a concentration area within the major consisting of 8 courses (32 credits) to include: three or four courses (12-16 credits) in upper division humanities, literature, and culture courses; three or four courses (12-16 credits) in upper division social science and history courses; and completion of Area 5504—Senior Project. No more than three courses may be taken in any one department.
Minor Sequence—East Asian studies

The minor requires successful completion of five courses (20 credits) at the 3xxx or 5xxx level related to East Asia. Courses must be drawn from three of the following four areas: history, social science, literature, and humanities. All courses must be taken A-F, with a grade of C or better. Students should design the minor in consultation with the Area Studies Programs adviser, from whom program approval is required.

Area courses are listed on pages 52-53 of this bulletin. For a complete list of East Asian studies courses, see the Area Studies Programs Handbook.

EAS 1032. Religions of East Asia. (4 cr, §RelA 3032) Religious aspects of Confucianism, Taoism, Buddhism, and Shintoism as practiced in East Asia; Christian missions in East Asia.

EAS 1461. Introduction to East Asia: Early Civilization. (4 cr, §Hist 3461) Farmer Rise and fall of the first great Chinese empire (Han) and early history of Vietnam, Korea, and Japan. Origins and development of Chinese society, government, and thought, and the introduction of Buddhism from India.


EAS 1463. Introduction to East Asia in Modern Times. (4 cr, §Hist 3463) Marshall Decline of Asian empires, rise of European and American imperialism; Asian responses: nationalism, social revolution, reintegration, modernization in China, Japan, Vietnam, Korea; retreat of European and American empires.

EAS 3013. Introduction to East Asian Art. (4 cr, §ArH 3013) Poor Major themes of the arts of China and Japan (not all-inclusive).

EAS 3211. Geography of East Asia. (4 cr, §Geog 3211, §Geog 5211) Hsu Physical and human geography of China, Korea, Japan; population pressure, economic development, and international relations.

EAS 3464. Early Modern China: 1350-1750. (4 cr, §Hist 3464, §Hist 5464) Farmer, Waltner The Ming and Ch’ing empires; expulsion of Mongols and centralization of imperial power; high point of Confucian bureaucratic rule, commercial development, philosophical innovation, popular fiction, Manchu conquest, and early Western contacts.


EAS 3471. 20th-Century J apan. (4 cr, §Hist 3471) Marshall World War I and Japan’s emergence as an industrial society and world power in the 1920s; the rise of militarism, World War II in the Pacific; political reform, economic resurgence, and cultural change in the postwar era.


EAS 3481. Modern J apanese Society. (4 cr, §Soc 3481; prereq intro soc course or #) Broadbent Japanese social institutions, including family, education, business, and labor relations, government, and the status of women. How they differ from the West and have contributed to Japanese economic success.


EAS 5481. Comparative Asian Development. (4 cr; prereq soc of development course, Asian-related courses or #) Broadbent Comparative politicoeconomic and sociocultural institutions creating high-speed growth and other social and political effects in the East Asian area, focusing on Japan and the “four little tigers:” Taiwan, South Korea, Hong Kong, and Singapore.

European Area Studies (EUR)

Dramatic changes in post-Cold War Europe present an exciting challenge to students interested in this region. Based on a broad interdisciplinary introduction, students may choose to concentrate
on one country or culture, a subregion of Europe, or issues of regional impact. Undergraduate major and minor programs are available in European area studies. Students are especially encouraged to include courses conducted in a language other than English as part of their undergraduate career, whether they are offered on campus or abroad. The Foreign Languages Across the Curriculum (FLAC) program offers students a number of opportunities to take two- or four-credit courses in French, German, and Spanish, while one-credit FLAC sections are offered in conjunction with some four-credit courses taught in English. These one-credit sections have been offered in French, German, Italian, Russian, Scandinavian languages, and Spanish. In spring quarter, FLAC courses offered in French, German, and Spanish provide students the opportunity to do all their coursework in one of these languages as participants in the Foreign Language Immersion Program (FLIP). To date, FLAC courses have been taught in area studies, geography, history, international relations, political science, and sociology.

B.A. Major Sequence—European Area studies

Students are admitted to the European Area studies major program upon successful completion of a set of premajor requirements and formal enrollment in the major at the Area Studies Programs advising office (214 Social Sciences Building). All premajor and major courses must be taken A-F and completed with a grade of C or better.

Required Preparatory Courses

To be accepted into the major, students must complete the following requirements: a minimum of 48 credits and good standing in CLA; at least three quarters of a European language (or equivalent, as determined by the relevant department); and at least 12 credits (minimum 3 courses) of lower division coursework related to European or Western civilization. At least one of the three courses must be from the humanities and at least one must be from the social sciences or history.

Major Requirements

Language—The minimum foreign language requirements for the European area studies major may be fulfilled by successful completion of one of the following: (1) three years (total of 9 quarters) of a European language sequence; (2) at least six quarters of European language study and at least six quarters of language study in a second European language; or (3) at least six quarters of foreign language study and an approved study abroad experience in Europe. (Note: Proficiency examinations and evaluations are provided by relevant language departments.)

Methods—A minimum of three courses (4 or 5 credits each) dealing specifically with approaches to and/or methods of scholarly inquiry to include the following: Area 3144—Scope and Methods of Area Studies, and two other approved courses in the social sciences, literature, or humanities, depending upon the nature of the student’s major program.

Breadth—All majors must complete the following core set of courses (four courses or a minimum of 16 credits): Geog 3161—Geography of Europe, Hist 3707—Social and Economic History of Modern Europe or Hist 3223—European Social History through Literature, Soc 3456—European Societies, and one 3xxx or 5xxx literature, humanities, cultural studies, music, or art history course focusing on Europe.

Concentration—All students in the program are required to develop a concentration area within the major consisting of 8 courses (32 credits), to include: three or four courses (12-16 credits) in upper division humanities, literature and culture courses; three or four courses (12-16 credits) in upper division social sciences and history courses; and completion of Area 5504—Senior Project. No more than three courses may be taken in any one department.

Area and FLIP Offerings—Students are encouraged to include topics or thematic courses offered under Area 3920/5920 and/or...

Symbols and abbreviations: f,w,s,su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / ♦—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / ♦—Credit will not be granted if credit has been received for the course listed after this symbol / ♦—Concurrent registration is required (or allowed) in the course listed after this symbol / ♦—Approval of the instructor is required for registration / ♦—Approval of the department offering the course is required for registration / ♦—Approval of the college offering the course is required for registration / H—Honors course (follows the course number) / —In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
the Foreign Language Immersion Program (FLIP) as part of their major program. Consult an adviser about these courses.

**Minor Sequence—European Area studies**

The minor requires completion of the CLA second language requirement in a European language plus 24 credits of 3xxx and 5xxx coursework chosen around a particular topic in European area studies (excluding language courses). A maximum of 4 credits may be in directed studies or directed research and courses must be drawn from a minimum of three different departments. All courses must be taken A-F, with a grade of C or better. Students should design the minor in consultation with the area studies adviser, from whom program approval is required.

Area Studies Programs courses are listed on pages 52-53 of this bulletin. For a complete list of European area studies courses, see the **Area Studies Programs Handbook** available in 214 Social Sciences Building.

**Latin American Studies (LAS)**

The proximity of Latin America to the United States and the long history of interaction with the region provides a strong incentive for the study of Latin America. The program offers a wide range of interdisciplinary courses in several Twin Cities campus colleges and through foreign study programs. It is possible to have a special thematic or regional concentration (e.g., human rights, women in Latin America, economic development, Brazil, Mexico, the Caribbean). Undergraduate major and minor programs are available in Latin American studies. Students are especially encouraged to include courses conducted in Spanish or Portuguese as part of their undergraduate career, whether they are offered abroad or on campus. The Foreign Languages Across the Curriculum (FLAC) program offers students a number of opportunities to take two- or four-credit courses in Spanish, while one-credit FLAC sections conducted in Spanish are offered in conjunction with some four-credit courses taught in English. In spring quarter, FLAC courses offered in Spanish and dealing with Latin American studies provide students the opportunity to do all their coursework in Spanish as participants in the Foreign Language Immersion Program (FLIP). To date, FLAC courses have been offered in Spanish in area studies, geography, history, international relations, political science, and sociology.

**B.A. Major Sequence—Latin American studies**

Students are admitted to the Latin American studies major program upon completion of premajor requirements and formal enrollment in the major at the Area Studies Programs advising office (214 Social Sciences Building). All premajor and major courses must be taken A-F and completed with a grade of C or better.

**Required Preparatory Courses**

To be accepted into the major, students must complete the following requirements: minimum of 48 general credits and good standing in CLA; at least three quarters of Spanish or Portuguese (or equivalent, as determined by the relevant language department); and the Latin American survey sequence Hist/LAS 3401, 3402, 3403 or at least 12 credits (minimum 3 courses) of 1xxx or 3xxx coursework related to Latin America of which at least one course must be in the humanities and at least one in history or social science.

**Major Requirements**

*Language*—The minimum foreign language requirement for the Latin American studies major may be fulfilled by successful completion of one of the following: (1) three years (total of 9 quarters) of Spanish or Portuguese language sequence which includes completion of either Span 1106, 3015, 3016 or Port 1006, 3003 and two other Port 3xxx courses. Topical courses taught as part of the Foreign Language Immersion Program (FLIP)/Spanish may qualify as alternatives to a 3xxx course; (2) at least six quarters of a Spanish or Portuguese language sequence and at least six quarters of language study in a second appropriate language; (3) at least six quarters of Spanish or Portuguese and an approved study abroad experience in Latin America. If a student selects a concentration with a Caribbean focus, it is possible to petition to have a comparable level of French or Dutch in lieu of Spanish or Portuguese requirements. (Note: Proficiency examinations and evaluations are provided by relevant language departments.)
Methods—A minimum of three courses (4 or 5 credits each) dealing specifically with approaches to and/or methods of scholarly inquiry to include the following: Area 3144—Scope and Methods of Area Studies, and two other approved courses in the social sciences, literature, or humanities, depending upon the nature of the student’s major program.

Breadth—All majors must complete the following core set of 3xxx or 5xxx courses (four courses or a minimum of 16 credits) in each of the following areas: social sciences, humanities, geography, and an elective relevant to the student’s course of study.

Concentration—All students in the program are required to develop a concentration area within the major consisting of 8 courses (32 credits), to include: three or four courses (12-16 credits) in upper division humanities, literature and culture courses; three or four courses (12-16 credits) in upper division social science or history courses; and completion of Area 5504—Senior Project. No more than three courses may be taken in any one department.

Area and FLIP Offerings—Students are encouraged to include topics or thematic courses offered under Area 3930/5930 and/or the Foreign Language Immersion Program (FLIP) as part of their major program. Consult an adviser about these courses.

Minor Sequence—Latin American studies

The minor requires successful completion of Span 1106 or Port 1006 (or equivalent), plus five 3xxx or 5xxx courses (20 credits) related to Latin America. Courses must be distributed as follows: 4 credits of history, 4 credits of humanities, 8 credits of social sciences, and 4 additional credits. All courses must be taken A-F, with a grade of C or better. Students design the minor in consultation with the Area Studies Programs adviser, from whom program approval is required.

Area courses are listed on page 52-53 of this bulletin. For a complete list of Latin American studies courses, see the Area Studies Programs Handbook available in 214 Social Sciences Building.


LAS 3134. Middle America. (4 cr, §Geog 3131) Barrett Physical and human geography of Mexico, Central America, and the Antilles. Internal and external area relationships.

LAS 3222. Peoples and Cultures of Middle America. (4 cr, §Geog 3222) Indigenous and mestizo cultures of Mexico, Guatemala, Belize, and Honduras. Traditional rural community and modernization, urbanization, and religious conversion.

LAS 3224. Hispanic Cultures of Latin America. (4 cr, §Anth 3224) Data from Mexico to South America and topics such as the economy, family, gender, religion, and ideology. Several conceptual frameworks used, including structural, symbolic, and cultural interpretations, history, and the impact of colonialism.

LAS 3250. Role of Renewable Natural Resources in Developing Countries. (2 cr, §FR 3250) Gregersen, Rose International perspective on important resource issues, including integration of natural resources, social and economic considerations; issues and case studies.


LAS 3401. Survey of Latin American History: Colonial Period to 1800. (4 cr, §Hist 3401) McCaa Pre-Hispanic and colonial period to 1800, with emphasis on social, cultural, and economic aspects.


LAS 3405. Latin American Women's Lives. (4 cr, §WoSt 3405)
Interdisciplinary study of women in a variety of Latin American countries with a focus on race, sexuality, education, class and ethnicity.

LAS 3602. Introduction to Brazil. (4 cr, §Port 3602)
Brazilian contemporary culture and society. Possible topics are related to history, culture (music, art, cinema, literature, architecture, theatre, popular culture, television), and social problems (ethnicity, the rain forest).

LAS 5131. Colonial Mexico and the Caribbean. (4 cr, §Geog 5131) Barrett
Exploration, discovery, settlement, livelihood, and circulation to about 1800.

LAS 5132. South America. (4 cr, §Geog 5132) Weil
Physical resources, population, agriculture, manufacturing, and transportation in South American countries.

LAS 5479. Latin American Government and Politics. (5 cr, §Pol 5479; prereq Pol 3051 or nonpolitical science grad or #) Sikkink
Latin American political heritage, political processes, contemporary public policy issues, problems of social, economic, and political change in selected countries.

LAS 5820. The Multinational Corporation. (3 cr, §PA 5820) Schuh
Economic, political, social, and legal significance of the multinational corporation; major policy options open to both individual bodies and international bodies.

LAS 5865. Housing in World Perspective I. (4 cr, §DHA 5865; prereq DHA 3863 or equiv)
Indigenous housing forms from around the world, with emphasis on village and rural housing; cultural differences; nature and quality of forms; application and implications for housing locally and nationally.

Russian Area Studies (RAS)
Russian area studies provides students with the knowledge to better understand the Russian world, its history, culture, and restructuring in the post-Soviet era. As Russia redefines its place in the world, and as trade and cultural links between Russia and the United States grow, Russian area specialists are increasingly needed. Undergraduate major and minor programs are available in Russian area studies.

B.A. Major Sequence—Russian area studies
Students are admitted to the Russian area studies major program after completing premajor requirements and enrolling in the major at the Area Studies Programs advising office (214 Social Sciences Building). All premajor and major courses must be taken A-F and completed with a grade of C or better.

Required Preparatory Courses
To be accepted into the major, students must complete the following requirements: minimum of 48 general credits and good standing in CLA; at least three quarters of Russian language study (or equivalent, as determined by the relevant language department); and at least 12 credits (minimum 3 courses) of 1xxx or 3xxx coursework related to Russia or Eastern Europe. At least one course must be in the humanities, and at least one in history or social sciences.

Major Requirements
Language—The minimum foreign language requirement for the Russian area studies major may be fulfilled by successful completion of one of the following: (1) three years (total of 9 quarters) of Russian language; (2) at least six quarters of Russian language and at least six quarters of language study in a second language relevant to the student’s academic program; and (3) at least six quarters of Russian language study and an approved study abroad experience in Russia or Eastern Europe. (Note: Proficiency examinations and evaluations are provided by relevant language departments.)

Methods—A minimum of three courses (4 or 5 credits each) dealing specifically with approaches to and/or methods of scholarly inquiry to include the following: Area 3144—Scope and Methods of Area Studies, and two other approved courses in the social sciences, history, literature, or humanities, depending upon the nature of the student’s major program.

Breadth—All majors must complete the following core set of courses (4 courses or a minimum of 16 credits): Geog 3181—Russia and Environs; Hist 3636—Russian History from the Origins to Peter the Great or Hist 3637—Russian History from Peter the Great to the Present; Russ 3421—Literature: Middle Ages to Dostoevsky in Translation or Russ 3422—Literature: Tolstoy to the Present in Translation; and one 3xxx or 5xxx course relevant to the student’s course of study.

Concentration—All students in the program are required to develop a concentration area
within the major consisting of 8 courses (32 credits) to include; three or four courses (12-16 credits) in upper division humanities, literature and culture courses; three or four courses (12-16 credits) in upper division social science and history courses; and completion of Area 5504—Senior Project. No more than three courses may be taken in any one department.

**Minor Sequence—Russian area studies**

The minor requires successful completion of Russ 1103 (or equivalent) plus five courses (20 credits) related to Russia, distributed as follows: Russ 3421 or 3422, Hist 3636 or 3637, Geog 3181 or Pol 5471, and 8 credits of 3xxx or 5xxx courses. All courses must be taken A-F with a grade of C or better. Students design the minor in consultation with the Area Studies Programs adviser, from whom program approval is required.

Area courses are listed on page 52-53 of this bulletin. For a complete list of Russian area studies courses, see the Area Studies Programs Handbook available in 214 Social Sciences Building.

**South Asian and Middle Eastern Studies**

The South Asian and Middle Eastern studies program focuses on the cultural traditions and contemporary problems of Afghanistan, Bangladesh, India, Iran, Nepal, Pakistan, Sri Lanka, Turkey, Iran, and the Arab world. Flexible major and minor programs in South Asian and Middle Eastern studies meet the needs and interests of individual students. For more information about this program, consult the Area Studies Programs office.

**Study Abroad**—The study abroad experience can provide an important comparative perspective within various cultural paradigms. Study abroad opportunities are available and appropriate courses taken abroad can be applied toward a major. See also Foreign Study.

**B.A. Major Sequence—South Asian and Middle Eastern studies**

**Major Requirements**

- Area 3144—Scope and Methods
- Two years (6 quarters) of a South Asian or a Middle Eastern Language
- Three 3xxx-5xxx literature courses
- Two 3xxx-5xxx religion and philosophy courses
- Four 3xxx-5xxx social science and history courses
- Area 5504—Senior Project

Programs must be designed in consultation with an adviser.

See the Institute of Linguistics and Asian and Slavic Languages and Literatures for South Asian and Middle Eastern Languages and Cultures course offerings.

**Minor Sequence—South Asian and Middle Eastern studies**

**Minor Requirements**—Five 3xxx-5xxx courses with a minimum of one course from literature and one from the social sciences or history

If you are pursuing a minor in South Asian and Middle Eastern studies, you are urged to fulfill the CLA language requirement with a South Asian or Middle Eastern language.

**Army ROTC**

See Reserve Officers Training Corps.
Art (ArtS)

Staff—Chair, Wayne Potratz, 210 Art Building; Director of Undergraduate Studies, Joyce Lyon, 202 Art Building (612/626-7844); Coordinator of Advising, Cindy Cribbs, 212 Art Building (612/625-1848); Director of Graduate Studies, Curtis Hoard, 212 Art Building (612/626-7699)

Professors Emeriti: MacKenzie, Myers, Rowan

Professors: Bethke, Hoard, Katsiaficas, Morgan, Pharis, Potratz, Rose

Associate Professors: Baldwin, Cowette, Feinberg, Gray, Hallman, Henkel, Krepps, Lane, Lucey, Lyon, Roode

The Department of Art provides instruction in drawing and painting, sculpture, printmaking, photography, ceramics, and electronic art, emphasizing the development of visual awareness through involvement in the creative process.

Students must pay a fee for some studio arts courses to cover part of the cost of expendable materials.

General Education—1401 introduces the concerns, media, and environment of the practicing artist, and concepts of creating visual art in contemporary and historical contexts. It should be taken before or concurrently with other 1xxx courses. It is a prerequisite for 3xxx courses.

Grades—All courses for the major and minor, whether required or elective, must be completed with C or higher grades. All courses for the major must be taken A-F, except seminars and the senior project.

Study Abroad—The department strongly encourages students to incorporate a foreign study experience into their undergraduate programs. Appropriate credits from such study can be applied toward a studio arts major or minor. Information on the department's summer program in China and other study abroad options and procedures is available in the Department of Art adviser's office and the Foreign Study section of this bulletin.

B.A. Major Sequence

Required Preparatory Courses—
1401: Introduction to Studio Arts
1101, 1301 or 1302, 1404, 1510 or 1520 or 1530 or 1540, 1701, 1811 or 1812
8 additional 1xxx studio arts cr

Major Requirements—
24 3xxx-5xxx cr in one studio arts specialization
16 additional 3xxx-5xxx studio arts cr
16 art history cr (8 cr must be 3xxx-5xxx)
5400—Concepts in Contemporary Art
8 cr related artistic expression
Exhibition during final quarter

B.F.A. Major Sequence

This program, leading to a four-year professional degree, offers an intensive concentration in visual arts work. It is designed for students planning to enter professional work or an M.F.A. program. Part of the liberal arts background includes the second language requirement.

Admission—Entrance is usually limited to students with B averages in studio arts courses. You should apply for admission no later than your final junior quarter. Application forms are available at the department office. Admission is based on scholastic record, slides of work, and faculty evaluations.

Accepted students are subject to review, and candidacy may be terminated if performance is unsatisfactory. In case of termination, you may transfer to the B.A. program.

A detailed statement of admission and program requirements is available in the department office.

Required Preparatory Courses—
1401: Introduction to Studio Arts
1101, 1301 or 1302, 1404, 1510 or 1520 or 1530 or 1540, 1701, 1811 or 1812
8 additional 1xxx studio arts cr

Major Requirements—
24 3xxx-5xxx cr in one studio arts specialization
16 additional 3xxx-5xxx studio arts cr
16 art history cr (8 cr must be 3xxx-5xxx)
5400—Concepts in Contemporary Art
8 cr related artistic expression
Exhibition during final quarter

Minor Sequence

Required Preparatory Courses—
1401, 8 1xxx studio arts cr
4 art history cr

Minor Requirements—16 3xxx-5xxx studio arts cr

Introductory Courses

Studio work and elements of drawing; contemporary and traditional methods; various drawing mediums.
ArtS 1102. Drawing II. (4 cr; prereq 1101) Cowette, Feinberg, Gray, Morgan, Roode
Work from life, nature and imagination; color and pictorial structure.

ArtS 1301. Sculpture. (4 cr) Baldwin, Lucey, Potratz, Rose
Structure; form and space. Direct construction in metal.

ArtS 1302. Sculpture. (4 cr) Baldwin, Lucey, Potratz, Rose
Structure; form and space. Clay, plaster, wood. Moldmaking and casting.

ArtS 1401. Introduction to Studio Arts. (4 cr) Bethke, Katsiaficas, Lyon, Morgan, Roode
Concepts of visual art-making in contemporary and historical contexts. The concerns, media, and environment of the practicing artist. Aesthetic foundation for beginning courses. The creative process, visual expression, criteria. Open to all students.

Handmade paper through historical and contemporary approaches. Exploration of the versatility of handmade paper toward a personal vision and aesthetic.

ArtS 1404. Color. (4 cr; prereq 1101) Feinberg, Lyon, Morgan
Structure and interaction of color and its visual implications in creative context.

ArtS 1510. Printmaking: Intaglio. (4 cr per qtr [8 cr max]) Bethke
Intaglio printing processes. Etching, engraving, and collagraphic techniques in creative context.

ArtS 1520. Printmaking: Lithography. (4 cr per qtr [8 cr max]) Krepps
Lithographic printing processes from stones and metal plates. Creative image making, processing, printing, and presentation using both traditional and extended methods.

ArtS 1530. Printmaking: Relief. (4 cr per qtr [8 cr max]) Bethke, Krepps
Traditional and contemporary relief printing media. Lino, woodcut, cardboard, metal, and letterpress techniques, and their aesthetic applications.

ArtS 1540. Printmaking: Screen. (4 cr per qtr [8 cr max]) Bethke, Krepps
Traditional and contemporary screen printing media. Paper stencil, tusche and glue, cut stencil, and photo stencil techniques, and their aesthetic applications.

ArtS 1602. Electronic Art. (4 cr)
Hands-on introduction to the use of computer technology for creating visual images.

ArtS 1701. Photo Medium. (4 cr) Hallman, Henkel
Contemporary and historical use of photography. Use of camera, film development, enlarging. The creative process.

ArtS 1811. Ceramics: Handbuilding. (4 cr) Hoard, Lane, Pharis
Introduction to hand-building techniques in clay for individual creative expression.

ArtS 1812. Ceramics: Wheelthrowing. (4 cr) Hoard, Lane, Pharis
Wheel-throwing techniques for individual creative expression.

Intermediate Courses

ArtS 3105. Painting. (4 cr; prereq 1101, 1102, 1401, 1404) Cowette, Feinberg, Katsiaficas, Lyon, Morgan, Roode
Studio work in painting. Fundamentals of visual art making via the paint media. Emphasis on visual language.

ArtS 3110. Drawing. (4 cr per qtr [12 cr max]; prereq 1101, 1102, 1401, 1404) Cowette, Feinberg, Gray, Katsiaficas, Lyon, Morgan, Roode
Various media and skills. Elements of drawing in relation to the human figure, nature, still life.

ArtS 3120. Painting. (4 cr per qtr [12 cr max]; prereq 1101, 1102, 1401, 1404, 3105, 4 cr 3110 or §3110) Cowette, Feinberg, Katsiaficas, Lyon, Morgan, Roode
Continued problems in painting. Individual projects. Emphasis on developing personal direction.

ArtS 3123. Dimensional Painting. (4 cr; prereq 1101, 1401, 1404) Feinberg
Two dimensional concepts combine with three dimensional form.

ArtS 3130. Watercolor. (4 cr per qtr [12 cr max]; prereq 1101, 1102, 1401, 1404) Hallman, Henkel
Transparent watercolor, gouache, casein, tempera. Figure, still life, landscape.

ArtS 3160. Drawing and Electronic Media. (4 cr per qtr [12 cr max]; prereq 1401, 1602, 4 cr of 3110) Katsiaficas
Expanding traditional drawing methods and materials with the use of electronic technology.

ArtS 3131. Nature of Abstraction. (4 cr; prereq 1101, 1102, 1401, 1404) Cowette, Morgan, Roode
Two-dimensional projects in varied media in which representational images from nature are transposed toward abstract syntheses through specific attention to visual elements (i.e., space and volume, line, value pattern, scale, color, depth, and mass).

ArtS 3301. Sculpture: Direct Metal. (4 cr; prereq 1301, 1302, 1401) Baldwin
Welding and brazing.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

ArtS 3302. Sculpture: Spatial Projects and Problems. (4 cr; prereq 1301, 1302, 1401) Rose
Methods of organizing space. Physical relationships between objects, elements, or materials, and how they can be manipulated to affect a space.

ArtS 3303. Sculpture: Cast Metal. (4 cr; prereq 1301, 1302, 1401) Potratz
Lost wax and sand casting in bronze, aluminum, and iron.

ArtS 3304. Sculpture: Wood and Stone. (4 cr; prereq 1301, 1302, 1401) Lucey
Wood and stone construction, assemblage, and arrangement.

ArtS 3305. Sculpture: Kinetics. (4 cr; prereq 1301, 1302, 1401) Baldwin
Constructions, kinetics, electronics.

ArtS 3306. Performance Art. (4 cr; prereq 1401) Lucey
Development of individual performance artworks and research of pioneers of this art form.

ArtS 3307. Sculpture: Modeling and Casting. (4 cr; prereq 1301, 1302, 1401) Baldwin, Potratz, Rose
Modeling with clay and other materials from human figure and other subjects; moldmaking with plaster and rubber; casting in plaster and other materials.

ArtS 3331. Primitive and Low-tech Approaches to Metal Casting. (4 cr; prereq 1302, 1401) Potratz
Metal casting of sculpture using techniques and materials from historical Meso-American, African, Indian, Chinese, and Japanese sources. Design and construction of primitive molds, tools, furnaces.

ArtS 3430. Paper: Pulp to Plastic Expression. (4 cr per qtr [12 cr max]; prereq 1401, one 1xxx ArtS course) Krepps
Creative and traditional approaches to papermaking.

ArtS 3510. Printmaking: Intaglio. (4 cr per qtr [12 cr max]; prereq 1401, 4 cr of 1510) Bethke
Intaglio techniques on metal and collagraphics. Embossing.

ArtS 3520. Printmaking: Lithography. (4 cr per qtr [12 cr max]; prereq 1401, 4 cr of 1520) Krepps
Planographic techniques on stones and plates.

ArtS 3530. Printmaking: Relief. (4 cr per qtr [12 cr max]; prereq 1401, 4 cr of 1530) Bethke
Relief printing techniques; emphasis on color processes.

ArtS 3540. Printmaking: Screen. (4 cr per qtr [12 cr max]; prereq 1401, 4 cr of 1540) Bethke
Screen printing techniques, emphasis on color and image development.

ArtS 3550. Expanded Approaches: Monoprints. (4 cr per qtr [12 cr max]; prereq 1401, 4 cr of 15xx or 3430) Krepps
Contemporary printmaking investigating alternative processes and results using monoprints, handmade paper and other print processes.

ArtS 3710. Photography. (4 cr per qtr [12 cr max]; prereq 1401, 1701) Hallman, Henkel
Photographic controls and processes. Related photosensitive media. Creative processes suited to individual interests.

ArtS 3810. Intermediate Ceramics. (4 cr per qtr [12 cr max]; prereq 1401, 1811, 1812) Hoard, Lane, Pharis
Advanced design problems with introduction to glaze and clay experimentation. Emphasis on personal expression.

ArtS 3811. Mold Made Ceramics. (4 cr; prereq 1401, 1811, 1812) Lane
Mold forming ceramics. Plaster mold making techniques. Conceptual and aesthetic issues as they apply to the making of ceramic objects.

ArtS 3830. Glass: Introduction to Neon. (4 cr [12 cr max]; prereq 1401) Lane
Forming of neon tubing for artistic expression.

Advanced Courses

ArtS 5110. Drawing. (4 cr per qtr [16 cr max]; prereq 12 cr of 3110) Caglioti, Cowette, Feinberg, Gray, Katsiaficas, Lyon, Morgan, Roode
Drawing in all mediums from life.

ArtS 5120. Painting. (4 cr per qtr [16 cr max]; prereq 12 cr of 3120) Cowette, Feinberg, Katsiaficas, Lyon, Morgan, Roode
Various media. Individual problems.

ArtS 5123. Dimensional Painting. (4 cr; prereq 3123 or #) Feinberg
Combining two-dimensional concepts with three-dimensional form.

ArtS 5130. Watercolor. (4 cr per qtr [16 cr max]; prereq 12 cr of 3160) Advanced watercolor techniques, aesthetic direction. Individual concepts and development of sensibilities.

ArtS 5160. Drawing and Electronic Media. (4 cr per qtr [16 cr max]; prereq 12 cr of 3160) Katsiaficas
Expanding traditional drawing methods and materials with the use of electronic technology.

ArtS 5310. Sculpture: Direct Metal. (4 cr per qtr [16 cr max]; prereq 3301) Baldwin
Advanced work in welding and brazing, metal construction.

ArtS 5320. Sculpture: Spatial Projects and Problems. (4 cr per qtr [16 cr max]; prereq 3302) Rose
Physical relationships between sculptural objects, elements, or materials, and how these can be manipulated to affect a space.

ArtS 5330. Sculpture: Cast Metal. (4 cr per qtr [16 cr max]; prereq 3303) Potratz
Lost wax and sand casting in bronze, aluminum, iron.

ArtS 5331. Primitive and Low-Tech Approaches to Metal Casting. (4 cr; prereq 3331 or #) Potratz
Metal casting of sculpture using techniques and materials from historical Meso-American, African, Indian, Chinese, and Japanese sources. Design and construction of primitive molds, tools, and furnaces.

ArtS 5340. Sculpture: Wood and Stone. (4 cr per qtr [16 cr max]; prereq 3304) Lucey
Wood and stone construction, assemblage, and arrangement.
ArtS 5350. Sculpture: Kinetics. (4 cr per qtr [16 cr max]; prereq 3305) Baldwin
Constructions, kinetics, electronics.

ArtS 5360. Performance Art. (4 cr per qtr [16 cr max]; prereq 3306) Lucey
Advanced individual performance artworks.

ArtS 5370. Sculpture: Modeling and Casting. (4 cr per qtr [16 cr max]; prereq 3307) Baldwin, Potratz, Rose
Modeling with clay and other materials. Moldmaking, casting in plaster and other materials.

ArtS 5430. Paper: Pulp to Plastic Expression. (4 cr per qtr [16 cr max]; prereq 12 cr 3430) Krepps
Creative and traditional approaches to papermaking.

ArtS 5510. Printmaking: Intaglio. (4 cr per qtr [16 cr max]; prereq 12 cr of 3510) Bethke, Krepps
Color processes. Intaglio and combined techniques.

ArtS 5520. Printmaking: Lithography. (4 cr per qtr [16 cr max]; prereq 12 cr of 3520) Bethke, Krepps
Color printing and planographic techniques.

ArtS 5530. Printmaking: Relief. (4 cr per qtr [16 cr max]; prereq 12 cr of 3530) Bethke, Krepps
Relief processes. Letterpress and combined techniques.

ArtS 5540. Printmaking: Screen. (4 cr per qtr [16 cr max]; prereq 12 cr of 3540) Bethke, Krepps
Screen processes and combined techniques.

ArtS 5550. Expanded Approaches: Monoprints. (4 cr per qtr [16 cr max]; prereq 12 cr of 3550 or #) Krepps
Advanced, contemporary printmaking using alternative processes, handmade paper, monoprinting, and other print processes.

ArtS 5710. Photography. (4 cr per qtr [16 cr max]; prereq 12 cr of 3710) Hallman, Henkel
Individual work in photographic controls, processes; related photosensitive media.

ArtS 5810. Ceramics. (4 cr per qtr [16 cr max]; prereq 12 cr of 3810) Hoard, Lane, Pharis
Aesthetic awareness and development; techniques and materials.

ArtS 5811. Mold-Made Ceramics. (4 cr; prereq 3811 or #) Lane
Molded ceramics. Plaster mold-making techniques. Conceptual and aesthetic issues as they apply to making ceramic objects.

ArtS 5821. Ceramic Materials Analysis. (4 cr; prereq 8 cr of 3810) Pharis

ArtS 5830. Glass: Neon. (4 cr per qtr [16 cr max]; prereq 12 cr of 3830) Lane
Advanced emphasis on conceptual and aesthetic applications of neon tube manipulation; applications to other media.

Advanced Entrance Courses

These courses, for advanced students only, provide technical background in specific media outside the student’s primary area. The courses are for graduate students in studio arts and other disciplines, junior and senior nonmajors, and transfer students. They are not open to undergraduate majors.

ArtS 5190. Drawing and Painting. (4 cr per qtr [16 cr max]; prereq #, ∆)

ArtS 5390. Sculpture. (4 cr per qtr [16 cr max]; prereq #, ∆)

ArtS 5590. Printmaking. (4 cr per qtr [16 cr max]; prereq #, ∆)

ArtS 5790. Photography. (4 cr per qtr [16 cr max]; prereq #, ∆)

ArtS 5890. Ceramics and Glassworking. (4 cr per qtr [16 cr max]; prereq #, ∆)

Special Courses

ArtS 3444. Senior Project. (2 cr; prereq ArtS major, #, ∆; S-N only)

ArtS 3970. Directed Studies. (1-5 cr per qtr [8 cr max]; prereq 24 ArtS cr, #, ∆, ∪)
Guided individual work.

ArtS 3980. Directed Instruction. (1-5 cr per qtr [8 cr max]; prereq #, ∆, ∪)
Students assist in teaching courses they have completed.

ArtS 5400. Concepts in Contemporary Art. (4 cr; prereq sr, ArtS major or #)
Seminar on contemporary art issues. Discussion, research, presentations or papers.

ArtS 5970. Directed Studies. (1-5 cr per qtr [12 cr max]; prereq 24 ArtS cr, #, ∆, ∪)
Guided individual work.

Workshop Courses

When offered, area designation follows course number and title in Class Schedule (e.g., ArtS 3420—Workshop: Kilnbuilding).

ArtS 3420. Workshop. (1-5 cr per qtr)

ArtS 5420. Workshop. (1-5 cr per qtr)

Symbols and abbreviations: f,w,s,su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / #—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / ∆—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / $—Credit will not be granted if credit has been received for the course listed after this symbol / ∆—Concurrent registration is required (or allowed) in the course listed after this symbol / ∆—Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / ∆—Honors course (follows the course number) / —In prerequisite listings, comma means "and" / UC—University College (formerly CEE)
Honors Courses

ArtS 3411H. Honors Tutorial. (2-4 cr; prereq honors candidate, Δ)
Individual consultation with faculty member on visual work, research project, presentations, or papers.

ArtS 3412H. Honors Tutorial. (2-4 cr; prereq honors candidate, Δ)
Individual consultation with faculty member on visual work, research project, presentations, or papers.

ArtS 3413H. Honors: Crossmedia Project. (2-4 cr; prereq honors candidate, Δ)
Projects that involve two or more instructors or areas in studio arts, or that involve two or more departments or disciplines within the University.

ArtS 3414H. Honors: Crossmedia Project. (2-4 cr; prereq honors candidate, Δ)
Projects that involve two or more instructors or areas in studio arts, or that involve two or more departments or disciplines within the University.

ArtS 3415H. Honors: Thesis. (2 cr; prereq honors candidate, Δ)
Advanced problems in studio and research. Exhibition.

ArtS 3416H. Honors: Thesis. (2 cr; prereq honors summa candidate, ¶ 3415H)
Research paper for summa candidates; must be taken concurrently with 3415H.

Art History (ArtH)

Staff—Chair, Frederick Asher, 108a Jones Hall; Director of Undergraduate Studies, John Steyaert, 106B Jones Hall; Director of Graduate Studies, Catherine Asher, 209 Jones Hall
Professors: F. Asher, Cooper, Marling, McNally, Poor, Weisberg
Associate Professors: C. Asher, Silberman, Staeyart, Stoughton
Adjunct Professors: Archer, Blade, Jacobsen, Jenkins, King, Mauer, McDonnell, Satkowski, Solomonson

The Department of Art History seeks to help students develop an awareness of the visual environment through historical examination of architecture, sculpture, painting, and other visual art forms.

For advanced work in art history, the department offers professionally oriented courses leading to a B.A. degree. M.A. and Ph.D. degrees in art history are also offered through the Graduate School.

General Courses—All 1xxx courses and most 3xxx courses are for general audiences.

Study Abroad—The department strongly encourages students considering either a major or minor in art history to include study in a foreign country into their program. Such study not only enriches the student through firsthand experience of another culture and language, it offers an invaluable opportunity for direct study of major artistic monuments. Credit for appropriate coursework can be applied toward both the major and minor in art history. For more information, see the Foreign Study section of this bulletin.

B.A. Major Sequence

Required Preparatory Courses—4 cr in art practice (consult the director of undergraduate studies). The CLA second language requirement satisfies the department’s language study requirement.

Major Requirements—37 cr, including four of the following: 3005, 3008, 3009, 3011, 3012, 3013, 3014, 3015, 3921; five additional art history courses (minimum 20 cr) of which at least two must be at the 5xxx level. All courses must be taken A-F.

Each student must complete a major project consisting of: a) a preliminary research paper in a designated “project course,” which may be either Art History 3930 (the junior-senior seminar) or any 5xxx course (to be selected by agreement with the instructor); b) Art History 3971—Major Project Research Paper. The major project course must be selected in consultation with the director of undergraduate studies.

Directed studies, independent study credits, and S-N credits may not be applied to the major. The major program must be approved by the director of undergraduate studies.

Minor Sequence

Preparatory Course—1002 or equiv

Minor Requirements—At least 20 3xxx-5xxx cr that must include four of the following: 3005, 3008, 3009, 3011, 3012, 3013, 3014, 3015, and one 5xxx art history lecture course.

Directed studies, independent study, and S-N credits may not be applied toward the minor. The minor program must be approved by the director of undergraduate studies.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArTh 1002</td>
<td>Introduction to the History of Art. (4 cr)</td>
<td>History of art, examined through selected monuments from the major periods of art from Paleolithic to modern times, covering Western and other cultures.</td>
<td></td>
</tr>
<tr>
<td>ArTh 1016</td>
<td>Introduction to Asian Art. (4 cr) F Asher, Poor</td>
<td></td>
<td>Major themes of Indian and East Asian art.</td>
</tr>
<tr>
<td>ArTh 1201</td>
<td>The Olympic Games. (4 cr, §3201, §CICv 3201, §CNES 1201, 3201) Cooper</td>
<td></td>
<td>Surveys the Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons with modern athletic events.</td>
</tr>
<tr>
<td>ArTh 1921</td>
<td>Introduction to Film Study. (4 cr, §Clit 1921) Silberman</td>
<td></td>
<td>Fundamentals of film language and major theories of cinema, presented through detailed analysis of several films.</td>
</tr>
<tr>
<td>ArTh 3005</td>
<td>American Art. (4 cr) Marling</td>
<td></td>
<td>Major issues in American painting, sculpture, architecture, and decorative arts from colonial era through contemporary period, with emphasis on relationships between visual/plastic arts and American social, political, and cultural history.</td>
</tr>
<tr>
<td>ArTh 3008</td>
<td>History of Ancient Art. (4 cr, §Clas 3008) F Asher, Cooper, McNally</td>
<td></td>
<td>Architecture, sculpture, and painting of selected early cultures; stress on influences contributing to the development of Western art.</td>
</tr>
<tr>
<td>ArTh 3009</td>
<td>History of Medieval Art. (4 cr) Steyaert</td>
<td></td>
<td>Medieval architecture, painting, and sculpture from early Christian through Gothic periods.</td>
</tr>
<tr>
<td>ArTh 3011</td>
<td>History of Renaissance and Baroque Art. (4 cr) Stoughton</td>
<td></td>
<td>Major monuments in architecture, sculpture, and painting from the early 14th century through the baroque period.</td>
</tr>
<tr>
<td>ArTh 3013</td>
<td>Introduction to East Asian Art. (4 cr, §EAS 3013) Poor</td>
<td></td>
<td>Major themes of East Asian art. Arts of China and Japan (not all-inclusive).</td>
</tr>
<tr>
<td>ArTh 3014</td>
<td>Art of India. (4 cr) C Asher, F Asher Indian sculpture and architecture from the prehistoric Indus Valley civilization through major historical periods to the present. Includes Buddhist, Hindu, and Islamic art.</td>
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<tr>
<td>ArTh 3015</td>
<td>Art of Islam. (4 cr) C Asher Architecture, painting, and minor arts of the Islamic world.</td>
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<tr>
<td>ArTh 3017</td>
<td>Islamic Culture. (4 cr) C Asher Islamic cultures, emphasizing visual arts and literature. Analysis of original sources for understanding the most significant cultural developments in this civilization, extending from Spain to the Indian subcontinent.</td>
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<tr>
<td>ArTh 3035</td>
<td>Mythology in Western Art. (4 cr, §Clas 3035) McNally</td>
<td></td>
<td>Selected figures and events from classical mythology as ancient artists first depicted them and as they have reappeared in later Western art.</td>
</tr>
<tr>
<td>ArTh 3142</td>
<td>Art of Egypt. (4 cr, §Clas 3142) McNally</td>
<td></td>
<td>The arts and architecture of Egypt from prehistoric times to the emergence of modern Egypt, with emphasis on the elements of continuity and of change that have shaped Egyptian culture.</td>
</tr>
<tr>
<td>ArTh 3152</td>
<td>Greek Art and Archaeology. (5 cr, §Clas 3152; offered alt yrs) Cooper, McNally Architecture, sculpture, painting, and archaeology from 1050 B.C. to 31 B.C.</td>
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<tr>
<td>ArTh 3162</td>
<td>Roman Art and Archaeology. (5 cr, §Clas 3162) Cooper, McNally Roman art and material culture: origins, change, continuity, “progress” or “decay” in the later empire.</td>
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<tr>
<td>ArTh 3201</td>
<td>The Olympic Games. (see ArTh 1201 for description)</td>
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<td>ArTh 3303</td>
<td>Baroque and Rococo Painting in France. (4 cr, §5357) Stoughton French painting of the 17th and first half of the 18th centuries.</td>
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<tr>
<td>ArTh 3411</td>
<td>History of Architecture to 1750. (4 cr, §Arch 3411) Stoughton History of architecture and city planning from antiquity to 1750, as illustrated by major monuments from Western and other cultures.</td>
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<tr>
<td>ArTh 3412</td>
<td>History of Architecture Since 1750. (4 cr, §Arch 3412) Weisberg History of the major monuments, concepts, and theories of urbanism and architecture since 1750.</td>
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<tr>
<td>ArTh 3422</td>
<td>History of 19th-Century Graphic Arts. (5 cr, §5422; offered alt yrs) Weisberg History and theory of the creation and evolution of lithography, social caricature (e.g., Daumier, Gavarni), the revival of etching at mid-century, and the emergence of color lithography at the turn of the century (e.g., Toulouse-Lautrec, Vuillard, Bonnard). Major artistic figs and revolutionary nature of the new media invented. Use of local print collections to strengthen the visual component.</td>
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<tr>
<td>ArTh 3484</td>
<td>The Art of Picasso. (4 cr) Weisberg Works of Picasso in all media. Emphasis on Blue, Rose, Cubist, Classical, and later periods of Picasso’s development against innovations in Modern European art of the early 20th century.</td>
<td></td>
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</tr>
</tbody>
</table>
ArtH 3575. Art of Walt Disney. (4 cr, §AmSt 3575) Marling
Disney’s cartoons, films, and theme parks in comparison to the “high” art of the period; assessment of his influence on American art and society.

ArtH 3585. Afro-American Art. (4 cr)
History of Afro-American Art from the 18th century through the present day.

ArtH 3595. American Folk Art in the 20th Century. (4 cr)
Function of folk art in an era of mass communication, mass consumption, and mass transportation. Placing folk objects within the context of their making and use, and evaluating how and why such objects retain their importance for the maker and within the community.

ArtH 3921-3922. Art of the Film. (4 cr per qtr)
Silberman
History of the motion picture as an art form; major films, directors, genres, and styles.

ArtH 3930. Junior-Senior Seminar. (4 cr; prereq ArtH major, jr or sr)
A major art-historical topic, figure, period, or genre. For advanced majors in art history.

ArtH 3940. Topics in Art History. (2-5 cr)
3942. Survey of American Indian Arts. (4 cr; §AmIn 3242)
Visual arts and crafts of North American Indians.

ArtH 3950, 3960. Topics in Art History. (4-5 cr)
3970. Directed Studies. (1-5 cr per qtr; prereq #)
Guided individual reading or study.

ArtH 3971. Major Project. (1 cr; prereq ArtH major, #; Comp 3013 recommended)
Completion of a research paper begun in a 5xxx “project course.”

ArtH 3975. Directed Museum Experience. (1-3 cr; prereq #; S-N only)
Internship or docentship in an approved program in an art institution or museum. Open to both majors and nonmajors. Must consult with director of undergraduate studies.

ArtH 5055. 18th-Century Architecture and the Enlightenment. (4 cr, §Arch 5055; prereq Arch 1021 or #; 2 lectures per wk)
Architecture, urban planning, and garden design in Europe, 1700-1850.

ArtH 5061. Contemporary Architecture. (4 cr, §Arch 5061; 3 lect, 1 sem hrs per wk)
Developments, theories, stylistic movements, and trends in architecture and urban design from World War II to present.

ArtH 5104. Roman Architecture. (5 cr, §Clas 5104; prereq jr or sr or #) Cooper, McNally
Buildings in Rome and the empire from the fifth century B.C. to the fourth century. Major archaeological sites.

ArtH 5105. Roman Painting and Mosaics. (5 cr, §Clas 5105; prereq jr or sr or #) McNally
Roman painting and mosaics, specific problems; sites such as Pompeii and Antioch.

ArtH 5107. Roman Sculpture. (4 cr, §Clas 5107; prereq jr or sr or #) Cooper, McNally
Sculpture of Rome and its provinces from the 1st century B.C. to the 4th century; role of sculpture in Roman politics and religion.

ArtH 5108. Greek Architecture. (4 cr, §Clas 5108; prereq jr or #) Cooper
Archaic and classical examples of religious and secular architecture and their setting in major archaeological sites.

ArtH 5113. Archaic Greek Art. (4 cr, §Clas 5113; prereq jr or #)
Cooper
Architecture, sculpture, and painting in Greek lands from 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques.

ArtH 5234. Gothic Sculpture of the Cathedral Age. (5 cr; prereq 3009 or 2 ArtH courses or #) Steyaert
Sculpture in France and Germany from 1150 to 1350. Emphasis on stylistic evolution.

ArtH 5324. 15th-Century Painting in Northern Europe. (5 cr; prereq jr or sr or grad or #) Steyaert
Painting in the Netherlands, France, and Germany during the late Gothic period; its influences.

ArtH 5346. Baroque Art in Italy and Spain. (5 cr; prereq 3011 or grad or #; offered alt yrs) Stoughton
Italian sculpture, painting, and architecture, and Spanish painting of the 17th century.

ArtH 5347. Baroque Art in France and the Lowlands. (5 cr; prereq 3011 or grad or #; offered alt yrs) Stoughton
French architecture, painting, and sculpture, Flemish and Dutch painting of the 17th century. Major artists: Rembrandt, Rubens, Poussin.

ArtH 5357. 18th-Century Art in France. (4 cr, §3303; prereq 3011 or grad or #; offered alt yrs) Stoughton
Rococo and neoclassical painting, sculpture, and architecture.

ArtH 5358. Eighteenth-Century Art in Italy, Germany, Austria. (4 cr; prereq 3011 or grad or #)
Stoughton
Italian painting, sculpture, and architecture; German and Austrian architecture.

ArtH 5422. History of 19th-Century Graphic Art. (5 cr, §3422; prereq one 3xxx ArtH course or grad or #) Weisberg
For description, see 3422.

ArtH 5423. Gothic Architecture. (4 cr, §Arch 5053, 5053; prereq Arch major or Arch 3411 or #)

ArtH 5425. Baroque Architecture in Italy. (4 cr, §Arch 5064, Arch 5064; prereq Arch major or Arch 3411 or #)

ArtH 5426. Architecture and Nature, 1500-1750. (4 cr; prereq 3411, 3412 or #) Solomonson
History of the interaction of architecture and nature in Italy, England, and France in the 16th and 17th centuries. Major monuments, their relationship to theories or architecture and gardening, urban and rural life.
ArH 5431. Age of Revolution: French Painting from 1789 to 1848. (5 cr; prereq one 3xxx ArH course or grad or #) Weisberg
Major styles and movements in France and their leading exponents: neoclassicism—David; romanticism—Corot, Delacroix; early landscape painting—the Barbizon group.

ArH 5432. Realism to Impressionism: French Painting from 1848 to 1886. (5 cr; prereq one 3xxx ArH course or grad or #) Weisberg
Realism of Courbet through end of impressionism. Roots of popular imagery, critical study of realism, radical innovation of impressionism.

ArH 5433. The Advent of Modernism: Later 19th-Century French Painting, 1886-1905. (5 cr; prereq one 3xxx ArH course or grad or #) Weisberg
Major styles and movements: postimpressionism, symbolism, fin de siècle jugendstil.

ArH 5434. Contemporary Architecture. (4 cr; no prereq) Solomonson
Developments, theories, movements, and trends in architecture and urban design from World War II to the present.

ArH 5435 (formerly ArH 5056). Modern Architecture. (4 cr; §Arch 5432; prereq Arch 1021 or 3411 or 3 lect, 1 sem hrs pr wk)
Architecture and urban design from early 19th-century sources in Europe and America to World War II.

ArH 5445. Art Nouveau. (5 cr; prereq one 3xxx ArH course or grad or #) Weisberg
History and evolution of the art nouveau movement in France, England, Belgium, Germany, Austria, Scotland, and the United States. Innovations in architecture, graphics, and the decorative arts; examination of the continental variants of the style (e.g., liberty style, jugendstil). Major promoters of the movement (e.g., S. Bing, Liberty & Company, J. Meier-Graefe) and pioneers of modern design (e.g., William Morris).

ArH 5463. Early 20th-Century Painting. (5 cr; prereq one modern art course or #) Weisberg
Fauvism, Cubism, Surrealism, Dadaism, and early abstraction.

ArH 5535. Art in the United States. (5 cr; prereq 4 cr art hist or #) Marling
Painting and sculpture in the United States. Selected key works and artists from early settlement to the early 20th century.

ArH 5546. American Architecture From 1860 to 1914. (5 cr; prereq sr or grad or #) Archer, Marling American architectural developments and European influences from the Civil War to about 1914. New materials and structural methods. Hunt, Richardson, McKim, Mead and White, Sullivan, early Wright, others.

ArH 5725. Ceramics of East Asia. (4 cr; offered alt yrs) Poor
Ceramic art in China, Korea, and Japan from Neolithic times to the present.

ArH 5765. Early Chinese Art. (5 cr; prereq 9 cr art hist or #, offered alt yrs) Poor
Ancient ceramics and ritual bronzes, early Buddhist sculpture, early Chinese painting.

ArH 5766. Chinese Painting. (5 cr; prereq 9 cr art hist or #, offered alt yrs) Poor
Major works from the 4th to the 17th centuries. Development of the landscape tradition and the literary genre of later Chinese painting.

ArH 5767. Japanese Painting. (4 cr; prereq jr or sr or #, offered alt yrs) Poor
Japanese pictorial arts from earliest to modern times; development of indigenous traditions.

ArH 5769. Connoisseurship in Oriental Art. (5 cr; prereq jr or sr or #; offered alt yrs) Poor
Oriental art objects in local collections.

ArH 5775. Early Indian Art. (5 cr; prereq 4 cr art hist or #) F Asher
Sculpture and architecture from the Indus Valley civilization through the Kushana period.

ArH 5776. The Art of India: 300 to 1200. (5 cr; prereq 4 cr art hist or #) F Asher
Issues of sculpture, architecture, and painting from the 4th century through the 12th century. Focus on Buddhist and Hindu monuments in the South Asian subcontinent, including the earliest Islamic monuments of India.

ArH 5777. Painting of India. (5 cr; prereq 4 cr art hist or #) C Asher
Painting, beginning with the early tradition of mural painting; miniature painting from the 12th century onward.

ArH 5781. Age of Empire: The Mughals, Ottomans, Safavids. (4 cr) C Asher
Development of art and architecture in three contemporary Islamic empires, Mughals of India, Safavids of Iran, and Ottomans of Turkey.

ArH 5783. Art of Islamic India. (4 cr) C Asher
Development of art and architecture in the Indian subcontinent from period of Islamic domination to Colonial period.

ArH 5785. Art of Islamic Iran. (4 cr) C Asher
Development of art and architecture in Iranian dominated Eastern Islamic realm: Iran, southern Soviet Union, and Afghanistan from inception of Islam to present.
ArtH 5787. Art of the Western Islamic World. (4 cr) C Asher
Development of art and architecture in western Islamic
world from inception of Islam to present.

ArtH 5925. History of Photography As Art. (4 cr; prereq 3012 or #) Silberman
Origins and development of photography, with attention to
technology and cultural impact. Major aesthetic
achievements in photography from its beginning to present.

ArtH 5940. Topics: Art of the Film. (4 cr per qtr; [prereq 3921-3922 or #) Silberman
Film and society. Sex and violence, race and ethnicity in
the cinema; films of the 1930s, 1950s, or 1960s.

ArtH 5950, 5960. Topics in Art History. (2-5 cr per qtr; [prereq #)
Topics specified in Class Schedule.

ArtH 5970. Directed Studies. (1-5 cr per qtr; [prereq sr or #)
Guided individual reading or study.

ArtH 5990. Directed Research. (1-5 cr per qtr; [prereq sr or #)

Asian Studies
See Area Studies Programs and Institute of Linguistics
and Asian and Slavic Languages and Literatures.

Astronomy (Ast)
Institute of Technology

Staff—Chair, T. W. Jones, 358 Physics;
Director of Undergraduate Studies, T. J. Jones, 355 Physics; Director of Graduate Studies, E.
Skillman, 353 Physics

Regents’ Professor Emeritus: Ney

Professors: Davidson, Dickey, Gehrz, Humphreys,
T. J. Jones, T. W. Jones, Kuhi, Rudnick, Woodward

Associate Professor: Skillman

Astronomy activities include observations of
stars, interstellar matter, galaxies, other
constituents of the universe, and formulation of
the laws that govern them.

A bachelor of science degree in astrophysics
is offered in the Institute of Technology.

A bachelor of arts in astronomy is offered in
CLA. Both programs can serve as preparation
for graduate school, work in industry, or
secondary school teaching.

General Education—1031 and 1032 are
descriptive courses open to all students; 1021H
is a more mathematical course for those pursuing

B.A. Major Sequence

Required Preparatory Courses—1021H;
Math 1251-1252-1261 or equiv; Physics
1251-1252-1253-1254

Major Requirements—3051, 5162 and one other
5xxx astronomy course; Math 3251, 3252, 3261 or
equiv; Physics 3512-3513, 3601, 5021, 5023, 5024

Major project: At least 3 cr of Ast 5990,
Directed Research

Majors are encouraged to take additional
5xxx astronomy, 3xxx and 5xxx physics,
mathematics, and/or computer science courses.
This is especially important for students
planning to pursue graduate work in astronomy.

Ast 1015f,w,s. Descriptive Astronomy
Laboratory. (1 cr, [1025H; prereq high school algebra;
high school trigonometry recommended; 2 lab hrs per wk)

Ast 1019. Our Changing Planet. (4 cr, [Geo
1019, [EEB 1019)
Interrelationships among Earth’s subsystems—solid earth,
oceans, atmosphere and biosphere, and solar and galactic
super-systems. Way the Earth works by interactions of
natural cycles, their rates, feedback, and human impact.

Ast 1021H. Introduction to Astronomy. (4 cr
with lab, [1011; prereq high school trigonometry and
physics or chem)
Solar system, stars, galaxies, and cosmology. A more
mathematical and physical discussion than Ast 1032.

Ast 1031f,w,s. Exploring the Universe—A. (4 cr,
[1011, 1021H, 1032; 3 lect hrs, 1 active learning session
hr per wk)
The human place in the universe. Study of the Earth as a
planet, other planets, the sun, stars and galaxies.
Background and fragility of life on Earth. Scale, origin,
and history of the universe and our relationship to it.

Ast 1032f,w,su. Exploring the Universe—L.
(4 cr, [1011, 1015, 1021H,1031; 3 lect hrs, 2 lab hrs per wk)
The human place in the universe. Study of the Earth as a
planet, other planets, the sun, stars, and galaxies.
Background and fragility of life on Earth. Scale, origin,
and history of the universe and our relationship to it.
Ast 1040w. Mathematics and Our Universe. (4 cr; 3 lect hrs, 1 active learning session hr per wk) Selected topics in mathematics to illustrate how basic mathematical concepts and reasoning are used to further our understanding of the universe. Emphasis on using an intellectually stimulating discipline to introduce and explore mathematical modes of thinking.

Ast 1201. Topics in Modern Astrophysics. (4 cr; prereq 1011 or 1021H or equiv, #) Current research problems in astronomy and astrophysics.

Ast 3051. Introduction to Astrophysics. (4 cr; prereq 1 yr calculus, Phys 1254 or #) The solar system, galaxy, and extragalactic universe. How information is obtained; conclusions from observations.

Ast 3970. Directed Studies. (1-5 cr per qr; prereq #, Δ) Independent, directed study in observational and theoretical astrophysics of interest to the student and a faculty member.

Ast 5061-5062. Computational Methods in the Physical Sciences. (4 cr, §Phys 5061-5062-5063; prereq for 5061—upper div or grad student or #; prereq for 5062—Phys/Ast 5061 or #; prereq for 5063—Phys/Ast 5062 or #; 2 lect, 6 lab hrs per wk) Solving problems in the physical sciences with computer programs. Emphasis on selected numerical methods and mapping problems onto computational algorithms. Techniques illustrated through examples chosen from classical mechanics, electrodynamics, fluid dynamics. Computer experiments involving these techniques carried out on SUN work stations in the physics building lab.


Ast 5164. Extragalactic Astronomy. (4 cr; prereq 5163 or #) Structure and evolution of external galaxies. Classification, stellar and gaseous contents, kinematics and dynamics, the extragalactic distance scale, clusters, galactic nuclei, and associated activity.

Ast 5165. Cosmology. (4 cr; prereq Phys 3513 or #) Large scale structure and history of the universe. Newtonian and relativistic world models, the Big Bang model, microwave background, physics of the early universe; cosmological tests, measurement of Hubble constant and deceleration parameter, galaxy formation.

Ast 5201s. Methods of Experimental Astrophysics. (4 cr; prereq 3051, Phys 3513; 2 lect, 6 lab hrs per wk) Contemporary techniques and instrumentation in astronomy. Astronomical observations, including data acquisition and instrument control using the facilities at O’Brien Observatory.


Ast 5990. Directed Research. (3 cr min; prereq #, Δ) Independent research in observational and/or theoretical astrophysics under the direction of a faculty member. For senior astrophysics and astronomy majors.

Behavioral Biology
See Ecology, Evolution, and Behavior.

Biblical Studies
Staff—Chair of Minor Committee, Jonathan Paradise, 330 Folwell Hall (625-5353)
Associate Professors: Paradise (Classical and Near Eastern Studies), Daniel Reisman (Classical and Near Eastern Studies), Philip Sellew (Classical and Near Eastern Studies)
translation or in the original languages. First-year Hebrew or Greek is required if you choose to study original texts in one of these languages. The courses required for the minor may be found under Classical and Near Eastern Studies.

**Minor Sequence**

**Minor Requirements**—Clas 3072; two courses from ANE 3501, 3502, 3505

One course from each of the following groups:

1. ANE 3501, 3502, 3505, 3521; Hebr 3201, 3202, 3203, 3204, 3205
2. Clas 5080 or Grk 3120

The minor program must be approved by a Biblical Studies faculty member.

**Biochemistry (BioC)**

College of Biological Sciences

**Staff**—Acting Head, David Bernlohr, 140 Gortner Laboratory of Biochemistry; Director of Undergraduate Studies, Clare Woodward

**Professors:** Allewell, Anderson, Bernlohr, Bloomfield, Conti-Fine, Fuchs, Lovrien, Nelsestuen, Raftery, Schottel, Tsong, C. Woodward

**Associate Professors:** Barry, Das, Flickinger, Wackett

**Assistant Professors:** Rougvie, Simon

Biochemistry is the study of the molecules, especially macromolecules such as proteins, nucleic acids, lipids, and carbohydrates that occur in living organisms.

A major leading to the B.S. degree is available through the College of Biological Sciences.

**General Education**—Courses especially appropriate for nonmajors include BioC 1401.

**BioC 1401. Elementary Biochemistry.** (4 cr, §3001, prereq Chem 1001 or one qtr college chem) Elementary survey of biochemistry with a brief introduction to organic chemistry. For students who need a general, non-intensive knowledge of the scope of biochemistry.

**BioC 3021. Biochemistry.** (4 cr, §Biol 5001; prereq Biol 1009 or Biol 1202, 8 cr organic chem) Fundamentals of biochemistry, including structure and function of proteins, nucleic acids, lipids, and carbohydrates; metabolism and regulation of metabolism; quantitative treatments of chemical equilibria, enzyme catalysis, and bioenergetics; chemical basis of genetic information flow.

**BioC 3960. Research Topics in Biochemistry.** (1 cr per qtr; S-N only) Lectures and discussions on current research in the department.

**BioC 5025. Laboratory in Biochemistry.** (2 cr; prereq 3021 or 5331 or ¶5331) Discussions of techniques and problem-solving approaches illustrated with lab experiments and demonstrations.

**BioC 5301. Ecological Biochemistry.** (3 cr; prereq 3021 or 5331 or ¶) Biochemistry of environmental processes. Biochemistry of organismal interactions, biological responses to environmental stress, gene transfer in the environment, and effects and fate of environmental toxins.

**BioC 5331. Structure, Catalysis, and Metabolism in Biological Systems.** (4 cr; §3021, §Biol 5001; prereq Biol 1009 or Biol 1202, 2 qtrs organic chem or ¶) Structure and function of biological molecules. Protein structure, catalysis, and intermediary metabolism. Enzyme kinetics, thermodynamics, and role of cofactors in catalysis.

**BioC 5332. Energy and Signal Transduction in Biological Systems.** (4 cr; prereq 5331 or ¶) Biological membrane structure and membrane-associated proteins. Processes such as transport, oxidation/reduction, photosynthesis, and electron transfer mechanisms, membrane receptors, signal transduction, specific regulatory systems.


**BioC 5352. Applied Microbial Biochemistry.** (4 cr, §MicB 5352; prereq 3021 or 5331 or MicB 5321, intro microbiology course or ¶) Biochemistry of microorganisms and enzymes of industrial interest. Overview of heterologous peptide overproduction by microorganisms and yeasts; polymer, antibiotic, organic acid, and amino acid production; genetics of industrially useful microorganisms; biological systems useful for biotransformation and environmental remediation; introduction to fermentation technology.

**BioC 5401. Metabolism and Its Regulation.** (3 cr; prereq 3021 or 5331) Principles determining metabolism of both common and unusual compounds in plants, animals, and microbes. Regulation of carbon and energy flow in whole organisms.

**BioC 5418. Topics in Molecular Immunology.** (4 cr; prereq MicC 5218) Molecular interactions occurring among proteins and peptides involved in immune recognition.


BioC 5528. Physical Biochemistry: Enzyme Kinetics. (4 cr, §Chem 5528, §MdBc 5528; prereq 2 qtrs physical chem, 5331 or BioC/MdBc 8001 or equiv) Theory and application of steady state and transient kinetics to the study of enzymes, enzyme systems, and cellular regulation.

BioC 5529. Protein Structure and Folding. (4 cr, §Chem 5529, §MdBc 5529; prereq 5331 or equiv, 1 qtr physical chem or #) Protein structure, stability, folding, and molecular modeling. Emphasis on results from X-ray crystallography, solution thermodynamics, NMR, computer graphics, and protein engineering.

BioC 5950. Special Topics. (1-5 cr; prereq #, ∆) BioC 5970. Directed Studies. (Cr ar; prereq #, ∆; S-N only; max of 10 cr of 5970 or 5990 may count toward major requirements) Individual study of selected topics or problems with emphasis on selected readings and use of scientific literature.

BioC 5990. Directed Research. (Cr ar; prereq #, ∆; S-N only; max of 10 cr of 5970 or 5990 may count toward major requirements) Lab or field investigation of selected areas of research.

College of Biological Sciences

The basic sciences, which are administratively housed in the College of Biological Sciences (CBS), also are part of the College of Liberal Arts; any CBS course listed in this bulletin can be applied toward CLA degrees. Descriptions of courses offered by CBS also may be found in the bulletin of that college. Information about requirements for entering CBS can be found on page 286.

Biology (Biol)

College of Biological Sciences

Staff—Dean, Robert P. Elde, Assistant Dean, Kathryn Hanna, 123 Snyder Hall; Director of Student Services, Kathleen Peterson, 223 Snyder Hall

Biologists are concerned with the fundamental properties of living things, from the interactions of molecules unique to life through the maintenance and integration of organisms to the interactions of populations with the environment over time.

CBS offers a program leading to the bachelor of arts (B.A.) degree in CLA and one leading to the bachelor of science (B.S.) degree in CBS. Information about the B.S. program may be found in the College of Biological Sciences Bulletin. Students interested in satisfying requirements for admission to programs in the health sciences will find that a biology major provides an excellent way to do so. Consult an adviser in the CBS Office of Student Services (612/624-9717) for more information.

Students interested in biology should also check for courses listed under Biochemistry (BioC); Ecology, Evolution, and Behavior (EEB); Genetics and Cell Biology (GCB); Microbiology (MicB); and Plant Biology (PBio).

General Education—Courses especially appropriate for nonscience and nonbiology majors include BioC 1401; Biol 1009, 1101, 1103, 1106, 1806, 1201, 1051, 3051, 3112; PBio 1009, 1012; EEB 1019, 3001, 3006, 3111; GCB 3002, 3008, 3022.

B.A. Major Sequence

Students must arrange an appointment with an adviser in the CBS Office of Student Services (612/624-9717, 223 Snyder Hall, St. Paul campus) to declare a major in biology.

Symbols and abbreviations: f,w,s,su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / #—Concurrent registration is required (or allowed) in the course listed after this symbol / —Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
**Required Preparatory Courses**—Biol 1009 or 1201, 1202, or exemption examination; Chem 1051-1052; Math 1251-1252 (grades of C or better required in preparatory courses)

**Required Major Courses**—

1. Math 1261; a two-qtr statistics sequence (Stat 3011-3012 or Stat 5021) with grades of C or above may be substituted for Math 1261.
2. Chem 3301, 3302, 3305, 3306
3. Phys 1104-1105-1106 with 1107-1108-1109 or Phys 1251, 1252, 1253 (1254 optional); a two-qtr sequence in physics (Phys 1041-1045, Phys 1042-1046) plus a 4- or 5-cr course in mathematics, statistics, computer science, or physical science may be substituted by petition with approval of the major adviser and the CBS Scholastics Committee. Petitions for substitution should be submitted to 223 Snyder Hall, St. Paul campus.
4. Students who take Biol 1009 must also complete 3011, 3012/3812 and 5013. Students who start with 1201-1202 must also take 3011, 3012/3812 and 5013, or they may choose to take 1203 and one organismal course (3011, 3012/3812 or 5013); all majors must also take BioC 3021 and Biol 5003, 5004, and 3008 (5041/5841).
5. 9 additional 3xxx-5xxx cr in biological science, including:
   a. Two courses involving lab or field work in biological sciences selected from the following list:
      - Biol 5125
      - BioC 5025, 5990 (4 cr minimum*)
      - EEB 5014, 5016, 5129, 5134, 5157, 5607, 5621, 5990 (4 cr minimum*)
      - GCB 5015, 5030, 5605, 5990 (4 cr minimum*)
      - MicB 5234, 5322, 5425, 5990 (4 cr minimum*)
      - PBio 3109, 3201, 5103, 5105, 5107, 5111, 5132, 5231, 5990 (4 cr minimum *)
   b. A major project—minimum of 4 cr in 5970 or 5990 taken in the biochemistry; ecology, evolution, and behavior; genetics and cell biology; microbiology; or plant biology departments. A maximum of 4 cr of 5970 or 5990 may be used toward the major.

(Courses from any of the following areas can be applied toward the major: biochemistry; biology; ecology, evolution, and behavior; genetics and cell biology; microbiology; and plant biology.)

Composition—one of the following courses is recommended to fulfill the upper division composition requirement: Comp 3015, Comp 3027, Comp 3033, Rhet 3562.

**Minor Sequence**

**Minor Requirements**—Biol 1009 or 1201-1202-1203 plus a minimum of 15 3xxx-5xxx cr chosen from courses carrying the following designators: BioC, Biol, EEB, GCB, MicB, PBio, Phsl

One course about animals (Biol 1106/1806 or 3011) and one course about plants (Biol 1103 or 3012/3812)

The minor program must be approved in the CBS Office of Student Services, 223 Snyder Hall (612/624-9717).

**Biol 1009. General Biology.** (5 cr; for majors that require a comprehensive survey of biology in a single qtr; high school chem strongly recommended; pre-biol majors see Biol 1201-2-3; non-science majors see 1201)

**Biol 1009H. General Biology.** (5 cr; prereq honors div or 3-4 yrs high school math, high school chem or Δ)

**Biol 1051. Environmental Studies.** (5 cr; §3051, §ES 1051)

**Biol 1101. Heredity and Human Society.** (4 cr; §5003, §GCB 3002; for students in programs not directly related to biological sciences)

**Biol 1101. Heredity and Human Society.** (4 cr; §5003, §GCB 3002; for students in programs not directly related to biological sciences)

**Biol 1103. General Botany.** (5 cr; §3012, §3812; prereq 1009 or 1202; students who plan to major in Biol in CLA or any bio sci major in CBS should take 3012 or 3812)

Organization levels of plants; plant function, growth and development, reproduction. Lab.

**Biol 1106. General Zoology.** (5 cr; §1806; prereq 1009 or 1202)

Survey of animal phyla; structure, function, behavior, adaptation, and evolutionary relationships. Lab includes dissections.
Biol 1201. Evolutionary and Ecological Perspectives. (5 cr; for non-biol major to meet the biol liberal ed req; also for pre-biol major in prep for 1202-1203. No chem background required)
Origins and foundations of modern evolutionary thought, putting evolutionary theory to work; evolution and ecology.
Lab. Can be taken as a single course or as the first in the Biol 1201-1202-1203 sequence.

Biol 1202. Molecular and Cellular Perspectives. (5 cr; §1009; prereq 1201, Chem 1051 or equiv)
Chemistry of living things, cell structure and transport, energy processing in cells, introduction to primary metabolism, molecular genetics, cell physiology, and regulation of development. Lab. To be taken as the second course in the Biol 1201-1202-1203 sequence.

Biol 1203. Organismal Adaptation and Diversity. (5 cr; §1103 and §1106 and §1806; prereq 1201, Chem 1051 or equiv or #)
How plants, animals, and microbes have adapted to similar environmental challenges, commonalities in these adaptations, and evolutionary diversity of organisms. Lab includes dissections.

Biol 1441. Preparation for Graduate Programs in Biology. (1 cr; prereq #; S-N only)
Study habits, time and money management, course participation, personal sacrifices.

Biol 1951, 1952, 1953. Biology Colloquium. (1 cr ea; S-N only)
Diversity of biology through seminars, lab tours, undergraduate research, trips to Itasca Biological Station, and interaction with other biology students and faculty.

Biol 1950. Biology Colloquium Project. (1 cr; prereq 1951 or 1952 or 1953 or ¶1951 or ¶1952, or ¶1953, # S-N only)
Individual project or research undertaken by a student concurrently enrolled in Biol 1951, 1952, or 1953, supervised by a faculty sponsor.

Biol 1961. Careers in Biology. (1 cr; prereq 1951 or 1952 or 1953; S-N only)
Exploration of career options in biological sciences. Introduction to career life planning techniques and decision-making skills. Interest, aptitude, and skills assessment. Preparation for an internship experience.

Biol 1949. Directed Instruction. (1 cr; prereq #; S-N only)
Hands-on use of microcomputers to introduce students in biology to how computers can help them manipulate data, prepare graphs and graphics, perform literature searches, prepare posters and reports, and communicate with others through the use of the computer network.

Biol 3008. Ecology and Evolution. (4 cr; §5841; prereq 1009 or 1201, Math 1142 or Math 1251)
Growth, structure, adaptation, and evolution of populations. Dynamics and evolution of biotic interactions and their effects on diversity and structure of natural communities. Function and stability of ecosystems.

Biol 3011. Animal Biology. (5 cr; §1106, §1806; prereq 1009 or 1202, Chem 1052)
Comparison of ways different phyla have solved similar physiological problems. Lab includes survey of major animal groups and physiological experiments, including dissections.

Biol 3012. Plant Biology. (5 cr; §1103, §3812; prereq 1009 or 1202, Chem 1052)
Plant diversity and evolution; structure and function of the plant cell and the whole organism; growth and development of plants. Lab.

Biol 3051. Environmental Studies. (4 cr; §1051, §ES 1051; bioscience students may not apply these credits toward the major)
Principles of ecology and current environmental issues including air and water pollution, human population growth, toxic and hazardous wastes, urbanization, land use, biological diversity, energy, environmental health, conservation history, attitudes towards nature, environmental politics, and ethics. Meets environmental theme for liberal education curriculum.

Biol 3111. Animal Biology. (4 cr, §3011; prereq 1106 or 1806, Chem 1052)
Lecture covering the comparative physiology of animal groups; coordination, movement, support, excretion, reproduction.

Biol 3112. Biological Rhythms and Timing Mechanisms. (4 cr; §5112; prereq 1009 or 1202 or #)
Timing mechanisms and rhythms of organisms in physiological processes, ecological adaptation, and health; current hypotheses concerning their cellular and molecular nature. Individual projects.

Biol 3950H. Undergraduate Seminar. (2 cr per qtr; S-N only)
Each quarter different members of the faculty lead discussions on topics of current interest.

Biol 3960H. Honors Seminar. (1 cr per qtr; prereq #; S-N only)
Open reports on topics of current interest to biologists; progress reports on lab and field research by participants.

Biol 3980. Directed Instruction. (1-3 cr per qtr; up to 8 cr may apply toward major; prereq #; S-N only)
Leadership opportunities for upper division students wishing to assist with the Biology Colloquium.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

**Biol 5003. Genetics.** (4 cr; §GCB 3022, §GCB 5022; prereq 5001 or BioC 3021 or BioC 5331)
Introduction to the nature of genetic information, its transmission from parents to offspring, its expression in cells and organisms, and its course in populations.

**Biol 5004. Cell Biology.** (4 cr; prereq 5001 or BioC 3021 or BioC 5331, Biol 5003 or BioC 5333)
Structures and functions of membranes, organelles, and other macromolecular aggregates found in plant, animal, and bacterial cells. Cell form and movement, intercellular communication, transport, and secretion.

**Biol 5013. Microbiology.** (5 cr; §MicB 3103, §MicB 5105, §VPB 3103; prereq 5001 or BioC 3021 or BioC 5331)
Taxonomy, anatomy, physiology, biochemistry, and ecology of microbes. Emphasis on molecular structure in relation to bacterial function.

**Biol 5125. Recombinant DNA Laboratory.** (4 cr, §5825, §MicB 5125, § MicB 5425; prereq ∆; application necessary)
Basic recombinant DNA techniques. Methods for growing, isolating, and purifying recombinant DNAs and cloning vectors.

**Biol 5150. Introduction to Neuroscience.** (3 cr, §NSc 5150, §Phsl 5150; prereq 3011 or equiv or Phsl 3055-3056, BioC 3021 or equiv or #)
Survey of neuroscience from invertebrates to humans. Ion channels and membrane currents, neurotransmitters and signal transduction, neuromatoxy, sensory and motor systems, learning and memory, emotion, disease states, neural networks, development.

**Biol 5950. Special Topics in Biology.** (1-5 cr per qr; prereq ∆)

**Biol 5951. Social Uses of Biology.** (3 cr; prereq 10 cr sciences; S-N only)
Influence of biological science on the quality of human life; agriculture, medicine, occupational health, environmental science, and theories of human nature. Responsibilities and roles of biologists in policy formulation in the scientific and political world.

Courses Offered at Lake Itasca Forestry and Biological Station
See also Summer Session Bulletin.

**Biol 1806. Zoology.** (5 cr; §1106; prereq 1009 or 1202, ∆)
Survey of animal phyla; structure, function, behavior, adaptation and evolutionary relationships. Lab includes dissections.

**Biol 3812. Plant Biology.** (5 cr, §1103, §3012; prereq 1009 or 1202, Chem 1052, ∆)
Plant diversity and evolution; structure and function of plant cell and of the whole organism; growth and development of plants. Field trips.

**Biol 5816. Field Biology Photography.** (5 cr; prereq course in beginning biol; ∆; A-F only)
Field photography techniques for documentation of insects, vertebrates, aquatic organisms, and habitats of the Itasca area. Emphasis on general photographic principles and applied advanced techniques using flash, reversed lenses, infrared photoelectric tripping devices. On-site processing of color slides and black- and-white films. No previous processing experience needed.

**Biol 5825. Recombinant DNA Laboratory.** (3 cr; §5125, §MicB 5125, §MicB 5425; prereq ∆, application necessary)
Basic recombinant DNA techniques. Methods for growing, isolating, and purifying recombinant DNAs and cloning vectors.

**Biol 5841. Ecology.** (5 cr, §5041; prereq 1103 or 1106 or 1806 or 3011 or 3012 or 3812, Math 1142 or 1251, ∆)
Growth, structure, and evolution of populations. Pairwise biotic interactions between species and their effect on the diversity and structure of natural communities. Nutrient dynamics, function, productivity, and temporal stability of ecosystems. Field work at Itasca station.

**Biol 5850. Special Topics in Biology.** (1-10 cr per qr; prereq ∆)

**Biol 5890. Research Problems at Itasca in Ecology, Evolution, Behavior, Entomology, Fisheries, Wildlife, Plant Pathology, Soil Science, or Zoology.** (Cr ar; prereq #, ∆)
Courses Offered in Denmark Through the Danish International Study Program (DIS)

**Biol 3991. Marine Biology of European Coastal Waters.** (4.5 cr; prereq 1 yr college biol incl lab, 1 college chem course, ∆)
Marine biology using Baltic and North Seas as focus for study. Biology of coastal waters, interactions between organisms and their environment, methods used by marine researchers to investigate biological systems. Students conduct simple experiments during field trips. Given in Copenhagen area, with study tour in northern and western Denmark.

**Biol 3992. Biological Oceanography.** (4.5 cr; prereq 1 yr college biol incl lab, 1 college chem course, ∆)
Interaction among biology, physics, and chemistry in the ocean, with special reference to unique characteristics of North and Baltic Seas. Effect of light, temperature, salinity, density, pressure, and limiting chemical constituents on marine biological systems. Problems in fisheries management. Given in Denmark.

**Biol 3993. Marine Biological Science Project.** (9 cr; prereq 3991, 3992 or equiv, 1 yr college biol incl lab, 1 college chem course, ∆)
Research project with practical field components. Students use scientific libraries of various research institutions, engage in discussions and seminars with leading Danish and German scientists, and conduct experiments on research ship and at Marine Biological Laboratory. Given in Denmark.
Biol 3994. Ecology and Human Impact in the North and Baltic Seas. (4.5 cr; prereq 1 yr college biol incl lab, 1 college chem course, ∆)
Ecosystems of North and Baltic Seas and how natural and human activities threaten their integrity. Given in Copenhagen area, with study tour in northern and western Denmark.

Biol 3995. Marine Vertebrate Biology. (4.5 cr; prereq 1 yr college biol, ∆)
Ecology and physiology of marine fish, birds, and mammals. Factors controlling vertebrate distribution and abundance. Role of vertebrates in marine ecosystems. Ecological impact of habitat alteration, pollution, fishing, and hunting, with emphasis on North and Baltic Seas. Given in Denmark.

Biostatistics (PubH)
Biostatistics no longer has an undergraduate major. Students are advised to consider statistics as an alternative. For information about the Biostatistics Graduate Program, contact Dr. Louis or Dr. Le. For a listing of biostatistics courses, consult the School of Public Health Bulletin.

Broadcasting
Students interested in broadcasting may wish to pursue a major in either journalism or speech-communication.

Cell Biology
See Genetics and Cell Biology.

Chemistry (Chem)
Institute of Technology
Staff—Chair, W. Ronald Gentry, 139 Smith Hall; Academic Vice Chair, Wilmer G. Miller
Professors: Barany, Barbara, Britton, Carr, Dahler, Davis, Ellis, Evans, Gentry, Gladfelter, Gray, Hoye, Lipsky, Liu, Lodge, Mann, L. Miller, W. Miller, Moscowitz, Noland, Pignolet, Que, Raftery, Stankovich, Swofford, Truhlar
Associate Professors: Cramer, Kass, D. Leopold, K. Leopold, Roberts, Tolman
Assistant Professors: Distefano, Forsyth, Munson, Musier-Forsyth, O’Doherty, Siepmann, Stein, Sun
Adjunct Faculty—Associate Professors:
Heilman, Krepski, Rasmussen

Chemistry probes the fundamental concepts of nature and helps us understand the world around us. Chemistry deals with matter — what substances are made of, their properties, and how they are transformed into new substances. Chemistry is central to research in areas such as superconductivity, biotechnology, high-tech polymers, drugs, energy, pollution, and new materials for electronics and catalysis.

The chemistry curriculum, which includes courses in chemistry, physics, and mathematics, covers the background necessary for a successful career in this field.

A special course program is recommended for bioscience chemistry majors. This program includes a number of substitutions, the appropriate biology and biochemistry courses, and a reduction in some of the normally required chemistry courses. It is also possible to obtain degrees in both chemistry and chemical engineering in the same time normally required for one of the degrees. This double major requires careful course planning and should be discussed as early as possible with a chemistry adviser. All chemistry majors are advised by faculty and staff in the chemistry advising office. Students submit one-year degree program plans in consultation with an adviser.

Special Opportunities—The chemistry department offers opportunities for undergraduate research with many of its outstanding faculty. Professional activities are available through membership in the Student Affiliate Program of the American Chemical Society. In addition, the department offers a number of scholarships and awards for outstanding chemistry majors. Information on these opportunities may be obtained from the chemistry advising office.

Transfer Students—It is recommended that prospective transfer students contact the advising office concerning the proposed transfer of courses before planning a curriculum. This can be done in writing, during a visit, or over the phone: Chemistry Undergraduate Advising, 135 Smith Hall, 207 Pleasant Street S.E., Minneapolis, MN 55455 (612/624-8008).
**MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS**

For Students Taking Beginning Courses—
All course offerings are for students who have taken high school chemistry. Completion of at least one course in high school chemistry is a prerequisite for Chem 1001 or 1051. High school chemistry is recommended preparation for all other courses; students who lack this background will be at a serious disadvantage.

All students taking Chem 1001 or 1051 are required to take the chemistry placement examination. For more information, contact General Chemistry, 115 Smith Hall, 207 Pleasant Street S.E., Minneapolis, MN 55455 (612/624-0026).

**High School Chemistry**—All course offerings are intended for students who have taken high school chemistry. Completion of at least one course in high school chemistry is a prerequisite for Chem 1001 and 1051. All students taking Chem 1051 are required to take the chemistry placement examination. For more information, contact General Chemistry, 115 Smith Hall, 207 Pleasant Street S.E., Minneapolis, MN 55455 (612/624-0026).

**B.A. Major Sequence**

**Required Preparatory Courses**—
Chem 1051-1052; Math 1251-1252-1261; Phys 1251-1252-1253

**Major Requirements**—Chem 3301, 3302, 3305, 3306, 3701, 5130, 5131, 5501 or 5534, 5502 or 5533 or 5535, advanced chemistry lecture elective (1 qtr), advanced chemistry laboratory electives (2 qtr), Math 3251, advanced technical electives, lecture (2 qtr), Major project: 2 cr minimum research project (Chem 3970 or 5970)

- Selected from Chem 3303 and any non-required 5xxx-level chemistry course
- Selected from Chem 3336, 5140, 5540, and 5740
- Selected from 3xxx- and higher-level courses in Chem, Biol, BioC, GCB, ChEn, MatS, Math, Phys, PubH, and Stat

**B.A. Minor Sequence**

**Minor Requirements**—The minor consists of 3xxx-5xxx courses totaling 21 credits. Chem 3301, 3302, and 3305 (Organic Chemistry) are required. The remaining credit requirements can be satisfied by lecture or laboratory courses in chemistry. Not more than 20 percent of the total 3xxx-5xxx credits in the minor program may be taken S-N. Grades of C or better are required in the minor program courses. At least 5 credits (two courses) must be completed at the University of Minnesota, Twin Cities.

Chem 1001. General Principles of Chemistry. (4 cr, §1003, §1008; for students not passing chem placement exam; prereq high school chem or equiv, 2 yrs high school mathematics required; 4 yrs recommended, high school physics recommended; 3 lect, 1 lab conf, one 3-hr lab per wk)
Chemistry, matter and energy, atoms, molecules, chemical bonding, mole and chemical calculations, gases, liquids, solids, chemical reactions, acids, bases, and equilibrium.

Chem 1002. Elementary Organic Chemistry. (4 cr, §3301, §3302; prereq 1001 or passing placement exam; primarily for nursing and forestry students; all IT students excluded without special permission; terminal course; 3 lect, 1 lab conf, one 3-hr lab per wk)
Short introduction to organic chemistry; emphasis on biological systems.

Chem 1003. Physical World, Chemistry. (5 cr, §1001-1002, §1008, all IT students excl; prereq 1 yr high school algebra; high school chem recommended; a terminal course—cannot be used as prereq for any other advanced chem course; 4 lect, 1 rec, one 2-hr lab per wk)
Fundamental concepts of chemical bonding, structure of matter, and forces in the physical world. Scientific methods and principles that contribute to understanding the environment and problems faced in improving it.

Labs to illustrate.

Chem 1008. Physical World, Chemistry. (4 cr, §any other college chem courses; prereq 1 yr high school algebra; high school chem recommended; a terminal course—cannot be used as prereq for any other chem course)
Fundamental concepts of chemical bonding, structure of matter, and forces on the physical world. Scientific methods and principles that contribute to understanding the environment and problems faced in improving it.

Chem 1051-1052. Chemical Principles II-I. (4 cr per qtr; prereq 1001 or passing placement exam; primarily for students majoring in science or engineering; 3 lect, 1 lab discussion, one 3-hr lab per wk)
Atomic theory, periodic properties of elements, chemical thermodynamics, development of structural concepts, geometry of molecules, bonding theory, behavior of gaseous and liquid states, solid state and materials, chemistry, dynamics, equilibrium, behavior of solutions, acids and bases, descriptive chemistry of elements and compounds; applications to environmental problems.

Chem 1051H-1052H. Honors Chemical Principles II-I. (4 cr per qtr; prereq selection for IT Honors curriculum or consent of IT Honors Office; 1001 or passing placement exam; 3 lect, 1 lab conf, one 3-hr lab per wk)
For description see Chem 1051-1052.

Chem 3100. Quantitative Analysis Lecture. (3 cr, for non-chemistry majors; prereq 1052; 3 lect per wk)
Introduction to the theory of quantitative chemical analysis.

Chem 3101. Quantitative Analysis Laboratory. (2 cr; prereq 3100 or §3100; two 4 hr labs per wk)
Introductory laboratory in quantitative chemical analysis.
Chem 3301. Organic Chemistry I. (4 cr, prereq 1052 or equiv; 4 lect per wk)
Important classes of organic compounds, their constitutions, configurations, and conformations; relationship between molecular structure and chemical reactivity.

Chem 3302. Organic Chemistry II. (4 cr; prereq 3301, 3305 or 13305; 4 lect per wk)
Reactions of organic compounds, nucleophilic substitution and addition; electrophilic substitution and addition; elimination reactions; molecular arrangements; oxidation and reduction.

Chem 3303. Organic Chemistry III. (4 cr; prereq 3302, 3306 or 13306; 4 lect per wk)
Chemical reactivities and methods for the synthesis and structural characterization of biologically important classes of organic compounds such as lipids, carbohydrates, amino acids, peptides, proteins, nucleotides, nucleosides, and nucleic acids.

Chem 3305. Organic Chemistry Laboratory I. (2 cr; prereq 3301 or 13301; 1 lab conf, one 4 hr lab per wk)
Laboratory techniques used in the preparation, purification, and characterization of typical organic substances.

Chem 3306. Organic Chemistry Laboratory II. (2 cr; prereq 3302 or 13302, 3305; 1 lab conf, one 4 hr lab per wk)
Continuation of Chem 3305.

Chem 3335H-3336H+. Honors Organic Chemistry Laboratory. (5 cr for sequence, § 3305, 3306, 3336; prereq 3301 or 13301, # Chem, ChemE, BioC majors only; A-F only)
Honors organic chemistry laboratory to take the place of 3305, 3306, and 3336.

Chem 3336. Organic Chemistry Laboratory III. (3 cr; prereq 3302, 3306; 1 lect, two 4 hr labs per wk; A-F only)
Emphasis on instrumentation routinely used in support of experimental work in organic chemistry.

Chem 3701 (formerly 5731). Introduction to Inorganic Chemistry. (4 cr; prereq 3302 or 13302; 4 lect)
Introduction to inorganic chemistry. Periodic trends. Structure and bonding concepts in compounds where s and p electrons are important. Descriptive chemistry of solids and transition metal compounds.

Chem 3970. Directed Studies. (Cr ar; prereq #)
On- or off-campus learning experiences, individually arranged between student and chemistry faculty member, in areas not covered by regular courses.

Chem 3991, 3992, 3993. Special Topics in Chemistry. (1 cr; prereq 1 qtr 1xxx chem or # S-N only, 1 lect per wk)
Topics in chemistry: opportunities and current research.

Chem 5122. Advanced Analytical Chemistry. (4 cr; prereq 3302, 5501 or 5534, 3 lect per wk)
Equilibria in aqueous and nonaqueous systems.

Chem 5126. Modern Analytical Chemistry. (4 cr; prereq 3302, 3306; Chem Eng majors only; two 1½ hr lect, one 4 hr lab per wk)
Strategies and techniques for solving modern analytical problems. Use of modern instruments in analysis.

Chem 5127. Analog Instrumentation. (5 cr; prereq Chem major or grad, Phys 1253, Math 3251 or equiv or #; three 1½ hr lect, one 3 hr lab per wk)
Basic principles of electronic circuitry; servo systems, operational amplifiers, feedback control, oscillators, and converters for signal processing and control of chemical measurement systems.

Chem 5130. Analytical Chemistry. (3 cr; prereq 3302, 3306; 3 lect per wk)
Primarily for chemistry majors. Methods and concepts of measurement by chemical and instrumental analysis, including titrimetry, quantitative spectrophotometric analysis, chromatographic separations, and equilibrium and rate methods emphasizing applications to organic and biochemical systems.

Chem 5131. Analytical Chemistry Laboratory. (2 cr; prereq 5130 or 15130; two lab lect, two 3 hr labs per wk)
Lab for 5130. High precision methods, acidimetry and complexometry, single and multicomponent analysis by spectrophotometry, analysis of mixtures by ion exchange and gas chromatography, enzymatic and rate methods.

Chem 5133. Chemical Instrumentation and Analysis Lecture. (3 cr; prereq 5130, 5131, 5501 or 5534; 3 lect per wk)
Introduction to the methodology and practices for solving analytical problems. Application of modern instrumental techniques.

Chem 5139. Chromatography and Separation Science. (3 cr; prereq Chem major or grad, 5133, 5140 or equiv or #)
Fundamental and practical aspects of gas liquid chromatography, modern liquid chromatography, electrophoresis, and other techniques used for analysis and separations.

Chem 5140. Chemical Instrumentation and Analysis Laboratory. (3 cr; prereq 5133, 5134, Chem majors only; 1 rec, two 4 hr labs per wk)
Instrumental techniques including spectroscopic methods and analysis, electrochemical methods of analysis, and analyses based on separation. Emphasis on using computers in data collection and reduction.
Chem 5302. Interpretation of Organic Spectra. (4 cr, §8302; prereq 3303 or equiv; 4 lect per wk)
Practical application of nuclear magnetic resonance, mass, and ultraviolet and infrared spectral analysis to solution of organic structural problems.

Chem 5311. Organic Synthesis I. (4 cr, §8311; prereq 3303 or equiv or #; 3 lect per wk)
Core course in organic synthesis which introduces fundamental concepts, reactions, reagents, structural and stereochemical issues, and mechanistic skills necessary for the understanding of organic chemistry.

Chem 5312. Organic Synthesis II. (4 cr, §8312; prereq 5311 or #; 3 lect per wk)
Advanced course in organic synthesis. Depending upon instructor and year, course will emphasize topics like complex carbon skeleton synthesis, asymmetric synthesis, and/or modern studies in organic chemistry.

Chem 5331. Advanced Organic Chemistry I. (4 cr, §8331; prereq 3303 and #)
Advanced course in organic chemistry. Depending upon year and instructor, course will emphasize heterocyclic chemistry, natural products chemistry, organic electrochemistry, synthetic applications of organometallic chemistry, solid-state chemistry, polymer chemistry and/or stereoreactivity.

Chem 5332. Advanced Organic Chemistry II. (4 cr; prereq 3303, #)
Advanced course in organic chemistry. Depending upon year and instructor, course will emphasize heterocyclic chemistry, natural products chemistry, organic electrochemistry, synthetic applications of organometallic chemistry, solid-state chemistry, polymer chemistry and/or stereoreactivity.

Chem 5501 (formerly 5520). Introduction to Thermodynamics and Kinetics. (4 cr, §5534; prereq 1052, Math 3251 or equiv, Phys 1253 or Phys 1106; 4 lect per wk)
Basic thermodynamics with applications to chemical and biological systems. Development of the concepts (enthalpy, entropy, Gibbs free energy, chemical potential) needed to understand the equilibrium properties of bulk matter and its physical and chemical changes. Brief introduction to chemical kinetics.

Chem 5502 (formerly 5521). Introduction to Quantum Theory and Spectroscopy. (4 cr; prereq 1052, Math 3251, Phys 1253 or Phys 1106; 4 lect per wk)
Introduction to quantum theory, and the electronic structures of atoms and molecules. Emphasis on their application to understanding spectroscopic techniques widely used by chemists and biochemists, including vibrations (IR, Raman), electronic (UV/vis, photoelectron) and spin (NMR, ESR) spectroscopies.

Chem 5526. Physical Biochemistry: Spectroscopic Methods I. (4 cr, §BioC/MdBc 5526; prereq 2 qtrs physical chem)
Lectures on fundamental spectroscopic principles. Emphasis on development of magnetic resonance theory used in study of biological macromolecules.

Chem 5527. Physical Biochemistry: Spectroscopic Methods II. (4 cr, §BioC/MdBc 5527; prereq 2 qtrs physical chemistry, two 1/2 hr lect per wk)
Application of optical and magnetic resonance techniques to study of structure and dynamics in proteins, lipids, nucleic acids, and synthetic analogs.

Chem 5528. Physical Biochemistry: Enzyme Kinetics. (4 cr, §BioC/MdBc 5528; prereq 2 qtrs physical chemistry, BioC 5331 or BioC/MdBc 8001 or equiv desirable; two 1/2 hr lect per wk)
Theory and application of steady-state and transient kinetics to the study of enzymes, enzyme systems, and cellular regulations.

Chem 5529. Protein Structure and Folding. (4 cr, §BioC/MdBc 5529; prereq BioC 5331 or equiv, 1 qtr physical chemistry or #; two 1/2 hr lect per wk)
Advanced course on protein structure, stability, folding, and molecular modeling. Emphasis on results from X-ray crystallography, solution thermodynamics, NMR, computer graphics, and protein engineering.

Chem 5533. Quantum Chemistry. (4 cr; prereq 1052, Math 3252 or Math 3252, Math 3261 or Math 3261, Phys 1253 or Phys 1253; 4 lect per wk)
Principles of quantum mechanics; applications to atomic and molecular structure and to spectroscopy.

Chem 5534. Chemical Thermodynamics. (4 cr; §5501; prereq upper div IT or CLA Chem major or A, 1052, Math 3251, Phys 1106 with # or Phys 1253 or Phys 1253; 4 lect per wk)
Principles of thermodynamics; application to chemical systems.

Chem 5535. Statistical Mechanics and Reaction Kinetics. (4 cr; prereq 5501 or 5534; 4 lect per wk)
Statistical thermodynamics and the kinetic theory of gases; application to reaction rate theory. Phenomenological kinetics and experimental methods. Continuation of 5534.

Chem 5538. Physical Chemistry Laboratory. (1 cr; prereq 5501 or 5535 or §5535; not open to Chem majors; one 3-hr lab per wk)
Experiments in thermodynamics and reaction kinetics.

Chem 5540. Physical Chemistry Laboratory. (3 cr; prereq 5502 or 5533, Chem majors only; 1 rec, on 4-hr lab per wk)
Laboratory experiments illustrating principles and methods of thermodynamics, reaction kinetics, and quantum mechanics.

Chem 5610. Polymer Science. (3 cr; §MatS 5610; prereq upper div, 3301; 3 lect per wk)
Polymer synthesis and physical chemistry: polymerization kinetics and reactors, molecular weight distribution, network formation, macromolecules in solution and their characterization, the glassy and crystalline state, rubber elasticity, flow and viscoelasticity, environmental degradation.

Chem 5702. (formerly 5732) Intermediate Inorganic Chemistry. (4 cr; prereq 3701, 5501 or §5501 or 5534 or §5534; 4 lect per wk)
Emphasis on transition metal chemistry. Advanced topics in main groups and materials chemistry.
Chem 5740. Inorganic Chemistry Laboratory. (3 cr; prereq 5702 or 5702, Chem majors only; 1 lect, two 4-hr labs per wk) Lab experiments in inorganic and organometallic chemistry illustrating synthetic and spectroscopic techniques.

Chem 5803. The Chemistry of Industry. (4 cr; prereq Chem Sr or grad or #; 3 lect per wk) Industry and polymer chemistry technology on which industry is based. Strong emphasis on economics, social problems, and the industrial environment.

Chem 5970. Directed Study. (Cr ar; prereq any 5xxx Chem course, #) On- or off-campus learning experiences, individually arranged between student and chemistry faculty member, in areas not covered by regular courses.

Chem 5991, 5992, 5993. Selected Topics in Chemistry. (Cr ar; prereq Sr, Δ) Topics of current interest. Consult department for details for a particular quarter.

Chicano Studies (Chic)

Staff—Chair, Guillermo Rojas, 102 Scott Hall
Associate Professor: Valdés

The department offers an interdisciplinary program leading to a major and minor in Chicano Studies. Courses are for students interested in the social, historical, and cultural experience of the Mexican population in the United States. The core courses introduce the student to historical and literary methodologies while exploring the germinal texts that portray the history of the Southwest from 1598 to the present. The Chicano Studies Program allows for flexibility in pursuing related work in Latin American Studies, Women's Studies, and Spanish. Students are encouraged to develop interests in other disciplines in order to seek double majors.

Study Abroad—Study in a Spanish-speaking country can help improve language skills and deepen understanding of Hispanic culture in the United States. The Chicano Studies department actively encourages students to include a study abroad experience as an integral part of their undergraduate program. Approved credits can be applied toward the major or minor. A number of relevant programs are available in Mexico, Central America, and the Spanish-speaking Caribbean. See Foreign Study.

B.A. Major Sequence

Spanish Language Proficiency—Span 1101, 1102, 1103 or proficiency oral exam required (documented 3 years of high school Spanish) or departmental translation exam.

Major Requirements—48 cr from the following 3105, 3106, 3107, 3115, 3212, 3213, 3330, 3375, 3427, 3428, 3441, 3442, 3507, 3508, 3510, 3511, 3712, 3970, 5901, 5920. These must include at least 8 credits from 3105, 3106, 3107. May include up to 8 credits of electives from other departments, with adviser approval.

Major project: 5970—Research Project (1-3 cr)

Minor Sequence

Required Preparatory Courses—Minimum of two courses from the following: Chic 3105, 3106, 3107

Minor Requirements—16 cr in 3xxx or 5xxx courses selected with approval of adviser

Chic 3105s. Introduction to Chicano Studies: The Beginnings. (4 cr) Convergence of Europe and America in Mesoamerica and the formation of Mexican society. Literary, social, cultural, and historical perspectives. Colombian period to 1821.


Chic 3107w. Introduction to Chicano Studies: The Chicano in Contemporary Society. (4 cr) Formation of contemporary Chicano political, economic, and cultural consciousness, and the forms in which it has been expressed, 1960 to the present.

Chic 3115f. Latinos in Education. (4 cr) Social, cultural, and professional issues encountered by the Spanish-speaking and other minorities in pursuit of opportunities in higher education.

Chic 3212s. La Chicana. (4 cr) Women of la raza, their impact on literature, history, society, politics, and culture.

Symbols and abbreviations: f,w,s—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / ¡—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / ¡—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / $—Credit will not be granted if credit has been received for the course listed after this symbol / $—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / Δ—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / —In prerequisite listings, comma means “and” / UC—University College (formerly CEE)

Chic 3375. Folklore of Greater Mexico. (4 cr) Rojas Survey of scholarly materials on Hispanic folk religion, arts, crafts, foodways, and oral literature.


Chic 3428. History of Relations Between United States and Mexico: 1821 to Present. (4 cr, §Hist 3428) Valdés U.S.-Mexico relations in the 19th and 20th centuries.

Chic 3441. Chicano History to 1900. (4 cr, §Hist 3441) Valdés History of Chicanos to 1900. The Spanish conquest and colonization of the borderlands, Mexican society in the early 19th century, the Mexican-American War and aftermath.

Chic 3442. Chicano History: 1900 to Present. (4 cr, §Hist 3442) Valdés Migration, repatriation, the Bracero program, contemporary Chicano politics, work, society, and culture.

Chic 3507. Introduction to Chicano Literature. (4 cr) Rojas History, background, readings in all genres of Chicano literature.

Chic 3508. Introduction to Chicano Literature: Text and Context. (4 cr) Rojas Major literary works by Chicano writers in their social and historical context.

Chic 3510. Chicano Literature: Topics. (4 cr per qtr [12 cr max]; §LAS 3510; prereq 3507 or 3508 or #; some knowledge of Spanish recommended) New dimensions in Chicano literature; prominent themes, figures, tendencies, trends.


Chic 3712. Chicanos: Psychological Perspectives. (4 cr) Psychological studies of Chicanos.

Chic 3970f, w, s, su. Directed Studies. (Cr ar; prereq #) Guided individual reading or study.

Chic 5901. Chicano Studies: Theory and Methodology. (4 cr; prereq grad or sr with #) Focus on theory and methodology of Chicano Studies scholarship in social sciences and humanities.

Chic 5920. Topics in Chicano Studies. (4 cr; prereq grad or sr, #) Multidisciplinary themes in Chicano Studies.

Chic 5970. Directed Studies. (Cr ar; prereq #) Guided individual reading or study.

Child Psychology (CPsy)

Institute of Child Development

Staff—Director, Richard A. Weinberg, 180 Child Development; Director of Undergraduate Studies, W. Andrew Collins, 104C Child Development; Assistant Director of Undergraduate Studies, Ann Mooney-McLoone; Director of Graduate Studies, Charles A. Nelson, 196 Child Development; Departmental Honors Adviser, Anne D. Pick, 170 Child Development


Associate Professors: Bauer, Masten, Sera

Lecturer: Galle, Mooney-McLoone, Murphy

Adjunct Faculty—Brookins (Social Work), Christenson (Psychology), Garmez (Psychology), Georgieff (Pediatrics), Grotevant (Family Social Science), Hoferman (Psychiatry), Hupp (Educational Psychology), Leon (Psychology), McConnell (Educational Psychology), Muret-Wagstaff (Pediatrics), Oberg (Pediatrics), Shapiro (Neurology), Thomas (VocTech Education), Turnure (Educational Psychology), Van den Broek (Educational Psychology), Williams (Public Health)

Child psychology deals with behavioral development and maintenance from the prenatal period to maturity in the spheres of cognition, ethology, genetics, language, learning, perception, and social behavior.

The Institute of Child Development is housed in the College of Education and Human Development. However, the child psychology B.A., B.S., and minor are CLA programs and all undergraduate child psychology courses are considered CLA courses; they count toward the CLA graduation and residency requirements. More information about child psychology majors, independent or directed study courses, and other current course offerings is available from the undergraduate advisory committee, 106 Child Development. Honors contract registration is available for most courses offered by the department with the exception of those offered S-N credit only. Qualified students should consult the Honors Program, 115 Johnston Hall.

For information about the specialized curriculum in nursery school and kindergarten education, see the College of Education and
Human Development Bulletin. If you are interested in studies leading to licensure for nursery school education, consult the adviser for the licensure program, 134C Child Development.

General Courses—1301, 3309, 5301, 5302, 5303, 5304, 5332 deal with general education subject matter that is often of interest to students in other concentrations.

B.A. Major Sequence

Required Preparatory Courses—1301; Psy 1001

Major Requirements—3308; Psy 3801 or equiv; 3331 or 5331, 3343, 5329

One course from 5332 or 5336; one course from 5341, 5343 or 5345; one course from 5311, 5315 or 5319

Senior project: 3960

Minimum of 12 additional cr in any 3xxx and 5xxx child psychology courses, which may include the following: 3330, 3980, 5970, 5990 (4 cr of each course may be counted toward the major)

Psychology cr may not be counted toward the 28 3xxx-5xxx cr outside the major. (Psychology-child psychology double majors are not permitted.)

B.S. Major Sequence

Required Preparatory Courses—1301; Psy 1001

Major Requirements—11-17 cr to include 3308, Psy 3801 or equiv, EPsy 5240 or 5849

12 cr from 3331 or 5331, 3343, 5329
8 cr from 3330 or 5330, 5334
4 cr from 5341, 5343, 5345
4 cr from 5332, 5336
8 cr from 5311, 5315, 5319
4 cr from senior project: 3960

12 cr from 3xxx or 5xxx CPsy courses, which may include 3980, 5970, 5990 (4 cr of each course may be counted toward the major)

22-24 cr from supporting field courses (list available from department)

Minor Sequence

Required Preparatory Courses—1301; Psy 1001

Minor Requirements—3308

One course from 3331 or 5331, 3343, 5329

8 cr from 5302, 5303, 5304, 5311, 5315, 5319, 5322, 5332, 5334, 5336, 5341, 5343, 5345, 5349

CPsy 1301f,w,s,su. Introductory Child Psychology. (4 cr, §3309, §5301; prereq 5 cr intro psy)

The science of child behavior; review of theory and research.

CPsy 3308f,w,s. Research Methods in Child Psychology. (4 cr; prereq 1301; Psy 1001)

Techniques used in the study of child development; emphasis on collection, organization, and analysis of data.

CPsy 3309f,w,s,su. Introductory Child Psychology for the Social Sciences. (4 cr, §1301, §5301; prereq Psy 1001)

The science of child behavior; review of theory and research. Designed for majors in psychology, sociology, and related disciplines; not suggested for child psychology majors.

CPsy 3330w,s. Directed Experiences. (1-4 cr per qtr, §5330; prereq 1301 or equiv, Psy 1004)

Intelectual and/or social development of children, adolescents, or adults as individuals or members of families or peer groups. Options include work with a specific age group or training in research methods, including experimental and observational techniques.

CPsy 3331f,w,s,su. Introduction to Social Development. (4 cr, §5331; prereq 1301 or equiv)

Development of social relations and personality; research, methodology, and contrasting theoretical perspectives. Findings on interpersonal relationships, the concept of self, prosocial and antisocial behavior, and acquisition of social roles.

CPsy 3343. Introduction to Cognitive Development. (4 cr; prereq 1301, 3308 or Psy 1005)

Development of cognitive processes: research, methodology, and contrasting theoretical perspectives. Introduction to research and theory in developmental psychology necessary to understand course material.

CPsy 3360H. Honors Seminar: Current Research in Developmental Psychology. (2 cr; prereq 1301 or equiv; primarily for child psy majors; S-N only)

Introduction to ongoing research programs, preparation for independent research (thesis research if honors major), discussion of career opportunities, other topics. Required for honors majors. Normally taken in junior year.

CPsy 3960f,w. Senior Project in Child Psychology. (1-4 cr [4 cr max]; prereq 1301, sr status, #; A-F only)

Review of the literature in a current topic area of child psychology.

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MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

CPsy 3980f,w,s,su. Directed Instruction. (1-4 cr per qtr [4 cr max]; S-N only)
Undergraduates serve as teaching assistants in courses they have completed for credit.

CPsy 5302w,s. Infancy. (4 cr; prereq 1301 or #)
Perceptual, motor, emotional, social, and cognitive development during the first two years of life; the developing infant in his or her social and physical environment.

CPsy 5303f,w,s,su. Adolescent Psychology. (4 cr; §3303; prereq 5 cr intro psy)
For description, see 3303.

Multidisciplinary introduction to aging and the aging process.

CPsy 5310. Topics in Child Psychology. (1-4 cr per qtr; prereq 1301)
Selected topics in the general content area.

CPsy 5311f,s,su. Introduction to Developmental Psychopathology. (4 cr, §3311; prereq 1301 or equiv, 3308 or Psy 1005)
Theories and research strategies to investigate origins and course of disordered behavior in children and adults, including description, etiology, development, excluding problems of physical, sensory, or mental handicaps.

CPsy 5315w. Introduction to Mental Retardation. (4 cr, §EPsy 5620; prereq 1301 or equiv)
Psychological and educational problems related to the mentally retarded.

CPsy 5319w. Introduction to Clinical Child Psychology. (4 cr; prereq 12 cr in psy or ed psy or soc or child psy)
Assessment and intervention procedures of clinical child psychology in clinical and community settings. Primarily for students not majoring in clinical psychology.

CPsy 5322w. Motor Development. (3 cr, §Kin 5131, §Kin 5132; prereq Kin 3132 or #)
Developmental aspects of motor skill acquisition from birth to physical maturity.

CPsy 5329. Genetics, Ethology, and Development. (4 cr; prereq 1301 or equiv)
Evolutionary theory and behavioral genetics applied to understanding of development of human behavior; formation of species-typical adaptive behavior and individual differences in infancy, childhood, adolescence.

CPsy 5330w. Directed Experiences. (1-4 cr per qtr, §3330; prereq 1301 or equiv, Psy 1004; A-F only)
Intellectual and/or social development of children as individuals or members of peer groups. Experiences offered in case study, social behavior, cognitive stimulation of children.

CPsy 5331f,w,s,su. Processes of Social Development. (4 cr, §3331; prereq 1301 or equiv)
Processes of individual change from infancy through adolescence and development of capacities for and influence of social relations: research, methodology, and theoretical perspectives.

CPsy 5332. Cross-Cultural Child Development. (4 cr; prereq 4 cr child psy)
Interdisciplinary, cross-cultural survey of theories and research on similarities and differences in cognitive, perceptual, socioemotional, and personality development; emphasis on child-caretaker relations and Asian and Hispanic cultures.

CPsy 5334. Children and Youth in Society. (4 cr; prereq 4 cr child psy)
Child development principles relative to social policy decision making: issues in applying theories, findings to problems (e.g., media influences, mainstreaming, day care, child abuse, effects of peers).

CPsy 5336f,s. Development and Interpersonal Relations. (4 cr, §5339; prereq 1301 or equiv, 3308 or Psy 1005, 3331 or 5331)
Processes and functions of interactions with parents and peers; analysis of theory and research on developmental changes and influences.

CPsy 5341. Perceptual Development. (4 cr; prereq 1301, 3308 or Psy 1005 or #)
Perceptual learning and the development of sensory and perceptual processes.

CPsy 5343. Cognitive Development. (4 cr; prereq 3343, 3308 or Psy 1005 or #)
Cognitive processes; relevant theory, research literature, and methodology.

CPsy 5345. Language Development. (4 cr; prereq 1301, 3308 or Psy 1005 or #)
Structure and function of language; factors influencing development; methodological problems, language scales, theories.

CPsy 5349. Children’s Learning and Intellectual Skills. (4 cr; prereq 1301, 3343 or #; not open to grads; offered alt yrs)
Current research on learning, problem solving, intellectual performance in children; practical applications.

CPsy 5353. Development During the School Years. (4 cr; prereq 4 cr psy)
Principles of psychological development, emphasizing ages 5-18. Theory and research from developmental psychology relevant to individual growth and achievement; issues in applying a developmental perspective to topics in child and adolescent development (e.g., fostering learning, risk for school failure, behavior and emotional problems, diversity).

CPsy 5970f,w,s,su. Directed Study in Child Psychology. (Cr ar; prereq #)
Independent reading.

CPsy 5990f,w,s,su. Directed Research in Child Psychology. (Cr ar; prereq #)
Individual empirical investigation.

Chinese
See Institute of Linguistics and Asian and Slavic Languages and Literatures.
Classical Civilization (ClCv)

Staff—Chair, Thomas Clayton, 300 Folwell Hall

Faculty—Akehurst (French and Italian), Aris (Regents’ Professor Emeritus, Chemical Engineering and Materials Science), C. Asher (Art History), Belfiore (Classical and Near Eastern Studies), Clayton (English, and Classical and Near Eastern Studies), Clouse (archaeologist, Minnesota Historical Society), Cooper (Classical and Near Eastern Studies, and Art History), Kelly (History), Liberman (German), McDonald (Regents’ Professor Emeritus, Ancient Studies, and Classical and Near Eastern Studies), Peterson (Philosophy), Sonkowsky (Classical and Near Eastern Studies), Stuewer (History of Science and Technology), Tracy (History), Wilson (History of Medicine)

This undergraduate interdisciplinary program encompasses the study of Greek and Roman cultures and their influence on Western civilization. Its primary goal is to investigate classical civilization and its heritage from several perspectives as well as the methods and aims of several disciplines.

Details about the program as well as a list of approved courses and information about special independent study and other learning opportunities are described in the Undergraduate Student Handbook, available in the Classical Civilization Office, 300 Folwell Hall. Proseminars and other courses are offered regularly.

Study Abroad—Relevant field experience in the Mediterranean region can greatly enhance an undergraduate program in classical civilization, as can study in foreign universities with strong curricula in this field. Appropriate credits from study abroad can be applied toward the major or minor. See also ClCv 3340 and Clas 5120. For information on options and procedures, see Foreign Study.

B.A. Major Sequence

Required Preparatory Courses—CLA language requirement in Greek or Latin

Major Requirements—80 cr in approved courses selected from four designated areas (at least 16 cr in language and literature; 16 in art history, archaeology, and history; 12 in thought and religion; 12 in classical traditions); at least 60 of these cr must be in 3xxx-5xxx courses, and courses from at least three departments must be represented in each program. A senior project as well as a minimum of 8 cr in classical civilization courses also are required.

Minor Sequence

Required Preparatory Courses—At least 15 credits in Greek or Latin, or pass proficiency examination in either; 12 credits in courses concerned with the culture of the country or countries where the chosen language was used.

Minor Requirements—15-25 cr in approved 3xxx-5xxx courses (one course from each of the four designated areas required for the major) selected with guidance by faculty adviser.

ClCv 3201. The Olympic Games. (4 cr, §Clas 1201, §Clas 3201) Cooper
Surveys the Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

ClCv 3340. Practicum in Archaeological Field Techniques. (4 cr, §Clas 3340, §Clas 5340) Cooper
Methods used for excavation on classical sites. Meets at a selected site in Minnesota for day-long sessions for one half quarter. Format arranged according to actual procedures in the field.

ClCv 3510. Great Books. (4 cr, prereq jr or sr or #) Clayton, staff
Intensive study of major works of classical antiquity and after (written in or translated into English), related by kind, theme, style, or perspective, sometimes including works from non-Western cultures.

ClCv 3711. Classics of Literary Criticism. (4 cr, §Engl 3711)
Principles of criticism used in major works by such writers as Plato, Aristotle, Horace, Longinus, Sir Philip Sidney, John Dryden, Samuel Johnson, David Hume, Samuel Taylor Coleridge, Matthew Arnold, and T.S. Eliot.

ClCv 3950. Topics in Classical Civilization. (1-5 cr per qtr)
Topics specified in Class Schedule.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

ClCv 3970. Directed Studies. (1-15 cr per qtr; prereq #)
Guided individual reading and study.

ClCv 3980. Directed Studies. (1-15 cr per qtr; prereq #)
Guided individual reading and study.

Classical and Near Eastern Studies

Staff—Chair, William W. Malandra, 330 Folwell Hall; Director of Undergraduate Studies, Robert Sonkowsky; Director of Graduate Studies, Nita Krevans

Regents’ Professors Emeriti: Aris, McDonald

Professor Emeritus: Erickson

Professors: Belfiore, Clayton, Cooper, Hershbell, Kelly, Keuls, McNally, Sonkowsky, Stavrou

Associate Professors: Krevans, Malandra, Nicholson, Paradise, Peterson, Reisman, Sellew, Sheets

Assistant Professor: Lardinois

The Department of Classical and Near Eastern Studies offers courses in the languages and literatures of Greece, Rome, and the Near East (including Indo-Iranian, modern Greek, and modern Hebrew); the archaeology and art history of these same civilizations and their prehistoric antecedents; religion; and the interconnected traditions of the Latin west, the Greek east, and the Jewish experience, down to the present.

Many sophomores can qualify to enroll in 3xxx courses. Students with four years of high school Latin, three years of high school Greek, or advanced placement may begin 3xxx courses as entering freshmen. All courses are open to nonmajors.

Courses with the “Clas” and “RelA” designations do not require knowledge of a foreign language.

Major programs are offered in Greek, Latin, Ancient Near Eastern Studies, Religious Studies, and Hebrew. In addition, the department contributes to the interdepartmental majors of Classical Civilization (see separate bulletin listing) and Jewish Studies (see separate bulletin listing). Minor programs are offered in Biblical Studies, Greek, Latin, Religious Studies, and Classical Civilization.

Study Abroad—Study in Europe or Israel may provide valuable enrichment for students with majors in the department. For information on options and procedures, see Foreign Study.

B.A. Major Sequence—Greek

Required Preparatory Courses—1104 or 1122 or 3052 or equiv and Δ; one course selected from Clas 1001-1003, 1023/3023, 1024/3024, 1025/3025 or Δ

Major Requirements—25 cr in Greek courses above 3052, of which at least 15 cr must be 34xx courses or higher

15 cr in Clas 3xxx-5xxx courses (except Clas 3046) and/or in Grk courses numbered above 3052

Major project: 3951

Minor Sequence—Greek

Required Preparatory Courses—See major sequence preparatory courses above

Minor Requirements—10 cr in Greek courses above 3052, of which at least 5 cr must be 34xx courses or higher

5 cr in Clas 3xxx-5xxx courses and/or in Grk courses numbered above 3052

B.A. Major Sequence—Latin

Required Preparatory Courses—1104 or 1122 or 3052 or four yrs high school Latin or equiv (students with three yrs high school Latin should enter 1104; with four yrs or advanced placement, any 3xxx course above 3052); one course selected from Clas 1004-1006 or 1023/3023—1025/3025 or Δ

Major Requirements—25 cr in Latin courses above 3052, of which at least 15 cr must be 34xx courses or higher

15 cr in Clas 3xxx-5xxx courses (except Clas 3046) and/or in Latin courses numbered above 3052

Major project: 3951

Minor Sequence—Latin

Required Preparatory Courses—See major sequence preparatory courses above

Minor Requirements—10 cr in Latin courses above 3052, of which at least 5 cr must be 34xx courses or higher

5 cr in Latin courses above 3052 or in 3xxx-5xxx classics courses
CLASSICAL AND NEAR EASTERN STUDIES

No more than one Lat 31xx course may be applied toward the minor. Clas 3046 may not be applied toward the minor.

B.A. Major Sequence—Ancient Near Eastern Studies

Required Preparatory Courses—Hebr 1013 or Hebr 1103, or Arabic 1103

Major Requirements—15 cr 3xxx or higher in Hebrew or Arabic, 10 cr in Akkadian or Aramaic or Sumerian, 8 cr anthropotogy (Anth 3201 req), 16 additional cr 3xxx or higher in art, archeology, history, language, or literature.

B.A. Major Sequence—Hebrew

Required Preparatory Courses—Hebr 3013 or equiv

Major Requirements—Hebr 3015-3016-3017, 8 cr biblical Hebrew, 8 cr rabbincics, 8 cr modern Hebrew, 4 cr using texts in translation, 4 cr major project.

B.A. Major Sequence—Religious Studies

Languages—six quarters or equivalent of Latin, Greek, Hebrew or Sanskrit.

Non-language and advanced language courses—
20 credits of required courses;
16 credits of electives;
Major project (4 credits)

Minor Sequence—Religious Studies

5 courses in at least three fields (Bible, Religion in Antiquity, Methodology/Philosophy, Comparative Study).
For details, contact the director of undergraduate studies.

Greek (Grk)

Grk 1101-1102. Beginning Classical Greek. (5 cr per qtr, §3051-3052; prereq 1101 or equiv for 1102)
Grk 1103. Selections From Greek Literature. (5 cr, §3051-3052; prereq 1102 or equiv) Prose and poetry.
Grk 1104. Greek Prose. (5 cr, §3051-3052; prereq 1103 or 2 yrs high school Greek or Δ) Selections from Lysias and/or Plato.
Grk 1111H-1122H. Honors Course: Beginning Classical Greek. (5 cr per qtr; prereq regis in honors program or high ability as indicated by college entrance records)

3051-3052. Beginning Ancient Greek: Accelerated. (5 cr per qtr, §1101-1102, §1103, §1104; previous expeir in another foreign language desirable)
Grk 3104. Greek Prose. (5 cr, §1104; prereq 3052 or 3002 or equiv or #) Classical Greek prose.
Grk 3105. Greek Drama. (5 cr; prereq 1104 or Δ) Euripides.
Grk 3106. Greek Poetry. (5 cr; prereq 1122 or 3052 or 3105 or Δ) Selections from Homer.
Grk 3120. The Greek New Testament. (5 cr per qtr [10 cr max]; prereq 1104 or 1122 or 3052 or 3106 or #, Δ) Sellew Emphasis on reading proficiency. No text read more than once every three years.
Grk 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458. Advanced Undergraduate Greek. (5 cr per qtr; prereq 3016 or 5 cr of 3120 or 3 yrs high school Greek or Δ) A cycle, with one course offered each quarter. 3451: Homer. 3452: Herodotus. 3453: Sophocles. 3454: Thucydides. 3455: Aristophanes. 3456: Plato. 3457: Euripides. 3458: Orators.
Grk 3951. Major Project. (5 cr; prereq Greek-Latin or Grk major, three 3xxx Greek courses or #) Research paper using the documents and other sources of Greece and Rome. Students select a topic in consultation with a faculty member whose interests are close to theirs.
Grk 3970. Directed Studies. (1-5 cr per qtr; prereq #, Δ) Guided individual reading or study.
Grk 5012. Prose Composition. (4 cr; prereq 3106 or Δ)
Grk 5121. Biblical and Patristic Greek. (4 cr, prereq 3106 or 3120 or Δ) Sellew Septuagint, Philo, Josephus, New Testament, Apostolic Fathers, and other patristic literature to 5th century C.E.
Reading and discussion of selected texts in the major genres.

Symbols and abbreviations: f.w.s.s.—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / Δ—Approval of the department offering the course is required for registration / UC—University College (formerly CEE)
Grk 5310, 5320, 5330, 5340, 5350, 5360, 5370, 5380, 5390. Greek Literature. (4 cr per qtr [12 cr max in each course])
One or more appropriate authors studied in each course.

Grk 5715. Introduction to Classical Philology. (4 cr, §Lat 5715) Sheets
Historical grammar of Greek and Latin from their Indo-European origin to the classical norms.

Grk 5716. History of Greek. (4 cr; prereq Grk/Lat 5715 or equiv, 2 yrs Greek) Sheets
Reading and analysis of documents illustrating the evolution of the Greek language from Mycenaean to modern times.

Grk 5970. Directed Studies. (1-5 cr per qtr; prereq #, ∆)
Guided individual reading or study.

Grk 5980. Directed Instruction. (Cr ar; prereq #, ∆)
Grk 5990. Directed Research. (Cr ar)

Coptic (Copt)
Copt 5011-5012. Elementary Coptic. (4 cr per qtr; prereq some knowledge of another ancient language, preferably Greek) Sellew 5011: Coptic grammar and vocabulary (Sahidic dialect); 5012: Further instruction in grammar, introduction to other dialects; first readings of texts.

Copt 5300. Readings in Coptic. (4 cr per qtr [12 cr max]; prereq Copt 5012 or equiv) Sellew
Advanced reading in a variety of Coptic literature, such as Nag Hammadi treatises, Hermetic writings, and Egyptian monastic texts. Authors vary from year to year.

Latin (Lat)
Lat 1101-1102. Beginning Latin. (5 cr per qtr; prereq 1101 or equiv for 1102)
Lat 1103. Selections From Latin Literature. (5 cr, §3051-3052; prereq 1102 or equiv)
Prose and poetry.

Lat 1104. Latin Prose. (5 cr; prereq 1103 or 3 yrs high school Latin or ∆)
Selections from Caesar and Cicero.

Lat 1111H-1122H. Honors Course: Beginning Latin. (5 cr per qtr; prereq regis in honors program or high ability as indicated by college entrance records)

Lat 3051-3052. Accelerated Beginning Latin. (5 cr per qtr, §1101-1102, §1103, §1104; previous exper in another foreign language desirable)

Lat 3104. Latin Prose. (5 cr; prereq 3052 or 3002)
Latin Republican prose.

Lat 3105. Latin Poetry. (5 cr; prereq 1104 or ∆)
Selections from Catullus and Ovid.

Lat 3106. Latin Poetry. (5 cr; prereq 1122 or 3052 or 3105 or ∆)
Selected books from Virgil’s Aeneid.

Lat 3440. Advanced Undergraduate Latin: Later Latin Authors. (5 cr per qtr; prereq 3106 or 4 yrs high school Latin or ∆)
Reading course covering Latin authors of Late Antiquity, the Middle Ages, and the Renaissance. Authors vary.

Lat 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458. Advanced Undergraduate Latin.
(5 cr per qtr; prereq 3106 or 4 yrs high school Latin or ∆)

Lat 3951. Major Project. (5 cr; prereq Latin major, three 3xxx Latin courses or #)
Research paper using the documents and other sources of Greece and Rome. Students select a topic in consultation with a faculty member whose interests are close to theirs.

Lat 3970. Directed Studies. (1-5 cr per qtr; prereq #, ∆)
Guided individual reading or study.

Lat 5012. Prose Composition. (4 cr; prereq 3106 or ∆)

Lat 5310, 5320, 5330, 5340, 5350, 5360, 5370, 5380, 5390. Latin Literature. (4 cr per qtr [12 cr max for each course])
One or more appropriate authors studied in each course. Authors vary from term to term and year to year. 5310: History. 5320: Epistles and essays. 5330: Oratory. 5340: Epic and pastoral. 5350: Lyric and Elegian poetry. 5360: Drama. 5370: Satire. 5380: Law. 5390: Religious texts.

Lat 5410. Latin Literature of Antiquity. (4 cr [12 cr max])
Pagan and Christian Latin literature selected from authors between 3rd and 8th centuries.

Lat 5420. Medieval Latin. (4 cr; prereq #)
Nicholson
Literature from 5th to 12th centuries; Carolingian and 12th-century Renaissance.

Lat 5621. Latin Paleography. (4 cr; prereq three 3xxx-5xxx Latin cr or #)
Analysis of various hands used in manuscripts of Latin authors with attention to date and provenance; transmission of ancient Latin literature.

Lat 5715. Introduction to Classical Philology. (4 cr, §Grk 5715) Sheets
Historical grammar of Greek and Latin from their Indo-European origin to the classical norms.

Lat 5717. History of Latin. (4 cr; prereq Grk/Lat 5715 or equiv or #, 2 yrs Latin) Sheets
Reading and analysis of documents illustrating the evolution of the Latin language from its earliest attestations to late antiquity.
Lat 5970. Directed Studies. (1-5 cr per qtr; prereq #, Δ) Guided individual reading or study.

Lat 5990. Directed Research. (Cr ar)

Classics (Clas)

Knowledge of Greek and Latin is not required for these courses. They may be of interest to students of literature, history, art history, and archaeology. Many may be applied to majors in classical civilization (see separate listing) and satisfy related coursework requirements for majors in Greek, Latin, or Greek-Latin.

Literature and Culture

Clas 1001. Age of Homer. (4 cr) Study of Homer and his epics; Trojan War. Other early Greek epics and the archaic period of tyrants and lyric poets; rise of Greek philosophy.

Clas 1002. Age of Pericles. (4 cr) “Golden age” of Athens in 5th century B.C. Emergence of Athenian democracy and origins of tragedy, comedy, and history; art and architecture.

Clas 1003. Age of Alexander. (4 cr) Military conquests of Alexander the Great and their results; Hellenistic philosophy, art, science, religion, and literature.

Clas 1004. Age of Caesar. (4 cr) Roman Republic from its origins to Caesar’s death.

Clas 1005. Age of Augustus. (4 cr) “Golden age” of Latin literature; the monuments. Transition from republic to empire.

Clas 1006. Age of Nero. (4 cr) The Roman Empire; “silver age” of Latin literature and rise of Christianity; art and architecture.

Clas 1023. Age of Constantine the Great. (4 cr, §3023) Nicholson Change and continuity in the Roman Empire from its zenith in the 2nd century through the 3rd century crisis to the New Empire of Diocletian and Constantine, the first Christian emperor (circa A.D. 180 to 363). Proscription of Classical paganism; Christianity as imperial religion.

Clas 1024. Age of Saint Augustine of Hippo. (4 cr, §3024) Nicholson Replacement of the Roman Empire in Western Europe by barbarian kingdoms (A.D. 363 to circa 500); consolidation of Constantinople as capital in the East. Literature, art, and thought resulting from Christianity becoming the religion of the Empire; pagan resistance.


CLASICAL AND NEAR EASTERN STUDIES

Clas 1043. Introduction to Greek and Roman Archaeology. (4 cr) McNally Role that material culture, including art and architecture, plays in forming our picture of the classical past. Relationship between archaeology and other disciplines dealing with the past. Selected examples used to consider motives and methods of research and how material culture has been used by archaeologists, their patrons, and the public.

Clas 1082. Jesus in History. (4 cr, §ReA 1082) Sellew Earliest attempts to describe Jesus and his significance in the emergent gospel literature of the first-century church. How historians may claim to know the facts of Jesus’ life and its meaning in light of these various presentations. Different literary portraits of Jesus and their reflection of their authors’ social, religious, and political situations. Modern situations and how they shape one’s own reading of the gospels and Jesus.

Clas 1201. The Olympic Games. (4 cr, §CIV 3201) Cooper Same as ArtH 1201. Surveys the Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

Clas 3007. The Pastoral Tradition. (4 cr, §5007; prereq 2 lit courses or #) Krevans Origins and development of pastoral poetry and prose. Readings in English translation from Greek and Latin pastoral poets, and vernacular imitations of the Middle ages and Renaissance. Nature of allegory, “debat-poems,” pastourelle, genre of pastoral.


Clas 3025. Age of Justinian and Muhammad.  (4 cr, §1025; prereq soph) Nicholson  
See Clas 1025. Additional reading of sources in translation for students in 3025.

Clas 3035. Mythology in Western Art.  (4 cr, §ArtH 3035) McNally  
Selected figures and events from classical mythology as ancient artists first depicted them and as they have reappeared in later Western art.

Clas 3071. Greek and Hellenistic Religions.  (4 cr, §3071H, §5071, §RelA 3071, §RelA 5071) Sellew  
Survey of ancient Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Prehistoric religion; Homer and the Olympian deities; music, dance, and procession as ritual performance; prayer and sacrifice; temple architecture and sanctuaries; oracles; beliefs about death and the afterlife; mystery cults; philosophical religion; criticism of traditional myths; ruler cult; Near Eastern salvation religions.

Clas 3071H. Honors Course: Greek and Hellenistic Religions.  (4 cr, §3071, §5071, §RelA 3071, §RelA 5071) Sellew  
See Clas 3071. Additional work for honors credit.

Clas 3072. The New Testament.  (4 cr, §3072H, §5072, §RelA 3072, §RelA 5072) Sellew  
Early Jesus movement in its social and historical setting: origins in Judaism; traditions about Jesus; Paul, his controversies and his interpreters; questions of authority, religious practice, and structure in early communities; apocryphal literature and emergence of a scriptural canon. Contemporary methods of New Testament study. Ancient sources studied as evidence for constructing critical history and as an attempt to appreciate their narrative structures and other literary techniques.

Clas 3072H. Honors Course: The New Testament.  (4 cr; §3072, §5072, §RelA 3072, §RelA 5072) Sellew  
For description, see Clas 3072. Opportunities for small group discussion.

Clas 3073. Roman Religion and Early Christianity.  (4 cr, §3073H, §5073, §RelA 3073, §RelA 5073) Sellew  

Clas 3073H. Honors Course: Roman Religion and Early Christianity.  (4 cr; §3073, §5073, §RelA 3073, §RelA 5073) Sellew  
See Clas 3073. Additional work for honors credit. Opportunities for small group discussion.

Clas 3081. Classical Epic in Translation.  (4 cr, §5081)  
Homer’s Iliad and Odyssey, Virgil’s Aeneid; cultural context of epic, the heroic character, epic formulas, poetic techniques.

Clas 3082. Greek Tragedy in Translation (Aeschylus, Sophocles, Euripides).  (4 cr, §5082)  
Origin of European drama as a distinct literary form; characteristics of Greek tragedy; ancient theatres and theatrical conventions. Selected tragedies. Problems related to cultural patterns of the time.

Clas 3089. Introduction to Biblical Archaeology.  (4 cr, §5089, §RelA 3089, §RelA 5089)  

Clas 3145. Greek and Roman Mythology II: Analysis and Tradition.  (4 cr, prereq 1042 or #) Sellew  
Methods of interpreting Greco-Roman myth, from Homer to Freud, Jung, and Levi-Strauss; artistic survival of classical myth in literature, painting, and music.

Clas 3201. The Olympic Games.  (4 cr, §1201, §ArtH 3201, §ClCV 3201) Cooper  
For description, see Clas 1201.

Clas 3970. Directed Studies.  (1-5 cr per qtr; prereq #, ∆)  
Guided individual reading or study.

Clas 5007. The Pastoral Tradition.  (4 cr, §3007; prereq 2 lit courses or #) Krevans  
Meets with Clas 3007. Additional work for graduate credit.

Clas 5013. Roman Law and Society.  (4 cr, §5013) Sheets  
Roman law as a social institution: basic concepts of persons, property, obligations in historical and social perspectives.

Clas 5071. Greek and Hellenistic Religions.  (4 cr, §3071, §RelA 3071, §RelA 5071) Sellew  
Meets with Clas 3071. Additional work for graduate credit.

Clas 5072. The New Testament.  (4 cr, §3072, §RelA 3072, §RelA 5072) Sellew  
Meets with Clas 3072. Additional work for graduate credit.

Clas 5073. Roman Religion and Early Christianity.  (4 cr, §3073, §RelA 3073, §RelA 5073) Sellew  
Meets with Clas 3073. Additional work for graduate credit.

Clas 5089. New Testament Proseminar.  (4 cr per qtr [12 cr max]; prereq 3072 or 5072 or #) Sellew  

Clas 5081. Classical Epic in Translation.  (4 cr, §5081)  
Meets with Clas 3081. Advanced independent work required.

Clas 5082. Greek Tragedy in Translation (Aeschylus, Sophocles, Euripides).  (4 cr, §5082)  
Meets with Clas 3082. Additional independent work required.
Clas 3089. Introduction to Biblical Archaeology. (4 cr, §3089, §RelA 3089, §RelA 5089)
For description, see Clas 3089. Requires additional work for graduate credit.

Clas 5145. Classical Mythology: Methodology, Interpretation, and Tradition. (4 cr, §3145; prereq 1042 or #)
Same coursework as Clas 3145; independent reading and research assignments in consultation with the instructor.

Clas 5794. Proseminar: Introduction to Classical Studies. (1 cr; prereq grad or #)
Research in classical scholarship, methods, bibliography, textual history, and criticism.

Clas 5970. Directed Studies. (1-5 cr per qtr; prereq #, &; Δ)
Guided individual reading or study.

Art and Archaeology
Clas 1043. Introduction to Greek and Roman Art and Archaeology. (4 cr) McNally
Role that material culture, including art and architecture, plays in forming our picture of the classical past. Relationship between archaeology and other disciplines dealing with the past. Selected examples used to consider motives and methods of research and how material culture has been used by archaeologists, their patrons, and the public.

Clas 3008. History of Ancient Art. (4 cr, §ArtH 3008) Cooper, McNally
Architecture, sculpture, and painting of selected early cultures; influences contributing to the development of Western art.

Clas 3035. Mythology in Western Art. (4 cr, §ArtH 3035) McNally
Selected figures and events from classical mythology as ancient artists depicted them and as they have reappeared in later Western art.

Clas 3089. Introduction to Biblical Archaeology. (4 cr, §3089, §RelA 3089, §RelA 5089)
Archaeological data relevant to Jewish scriptures and the New Testament; major sites in the Holy Land and in other areas of the Mediterranean and Near East. Evidence of pottery, inscriptions, manuscripts, and coins. Excavation methods. Archaeology as a tool for study of ancient religions. Requires additional work for graduate credit.

Clas 3142. Art of Egypt. (4 cr, §ArtH 3142) Cooper, McNally
Arts and architecture of Egypt from prehistoric times to the emergence of modern Egypt, with stress on the elements of continuity and of change that have shaped Egyptian culture.

Clas 3152. Greek Art and Archaeology. (5 cr, §ArtH 3152) Cooper, McNally
Architecture, sculpture, painting, and archaeology from 1050 B.C. to 31 B.C.

Clas 3162. Roman Art and Archaeology. (5 cr, §ArtH 3162) Cooper, McNally
Roman art and material culture: origins, change, continuity, “progress” or “decay” in the later empire.

Clas 3175. The Topography of a Medieval City: Constantinople. (4 cr, §5175, §ArtH 5175)
Study of Constantinople, a world capital and imperial residence for more than a millennium. Original and translated texts and archaeological evidence used to reconstruct individual monuments and broader patterns of urban life and urbanistic development from circa 200 until the Turkish conquest of 1453.

Clas 3252. History of Early Christian Regions and Byzantine Art. (4 cr, §ArtH 3252)
Architecture, sculpture, and painting in eastern Christian regions, from founding to fall of Constantinople. Meaning and broader cultural context in which works of art were created.

Clas 3340. Practicum in Archaeological Field Techniques. (4 cr, §5340, §CivC 3340; prereq Grk or Lat or Hebr or ANE or CivC major or #, one course in ancient art or archaeology) Cooper
Methods used for excavation on classical sites. Meets at selected site in Minnesota for day-long sessions for one half quarter. Format arranged according to actual procedures in field.

Clas 5089. Introduction to Biblical Archaeology. (4 cr, §RelA 5089)
Archaeological data relevant to the Jewish scriptures and the New Testament; major sites in the Holy Land and in other areas of the Mediterranean and the Near East. The evidence of pottery, inscriptions, manuscripts, and coins. Excavation methods. Archaeology as a tool for study of ancient religions. Requires additional work for graduate credit.

Clas 5102. Classical Greek Art.
Clas 5103. Hellenistic Art and Archaeology.
Clas 3340. Practicum in Archaeological Field Techniques.

Clas 5101. Introduction to Prehistoric Greek Archaeology. (4 cr, prereq jr or #)
Aims and methods of modern field archaeology; the record of human habitation in the Aegean area from earliest times to the end of the Bronze Age; concentration on the Mycenaean period. Archaeological evidence as the basis for historical reconstruction.

Clas 5102. Classical Greek Art. (5 cr, §ArtH 5102)
Architecture, sculpture, and painting in Greece from the Persian Wars to the conquests of Alexander.

Clas 5103. Hellenistic Art and Archaeology. (4 cr, §ArtH 5103; prereq jr or sr or #)
Sculture, architecture, painting, and topography in developing centers of Hellenistic culture in eastern Mediterranean from 400 B.C. to end of Hellenistic period.

Symbols and abbreviations: f—fall, w—winter, s—spring, u—summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / #—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / #—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / §—Concurrent registration is required (or allowed) in the course listed after this symbol / &—Approval of the instructor is required for registration / Δ—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / —In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
### MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Clas 5104</td>
<td>Roman Architecture. (5 cr, §ArtH 5104; prereq jr or § Cooper, McNally)</td>
<td>Buildings in Rome and the empire from the 5th century B.C. to A.D. 4th century. Major archaeological sites.</td>
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<tr>
<td>Clas 5105</td>
<td>Roman Painting and Mosaics. (5 cr, §ArtH 5105; prereq jr or # McNally)</td>
<td>Roman painting and mosaics; specific problems; sites such as Pompeii and Antioch.</td>
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<tr>
<td>Clas 5106</td>
<td>Greek Painting. (5 cr, §ArtH 5106; prereq jr or § McNally)</td>
<td>Research and analysis in classical art as applied to the study of vases, original objects, and sources.</td>
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<tr>
<td>Clas 5107</td>
<td>Roman Sculpture. (4 cr, §ArtH 5107; prereq jr or § Cooper, McNally)</td>
<td>Sculpture of Rome and its provinces from the 1st century B.C. to A.D. 4th century; role of sculpture in Roman politics and religion.</td>
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<tr>
<td>Clas 5108</td>
<td>Greek Architecture. (4 cr, §ArtH 5108; prereq jr or § Cooper)</td>
<td>Archaic and classical examples of religious and secular architecture and their setting in major archaeological sites.</td>
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<tr>
<td>Clas 5111</td>
<td>Bronze Age Art and Architecture in Greece, CA. 3000-1100 B.C. (4 cr, §ArtH 5111)</td>
<td>Artistic and architectural forms in Neolithic period in Aegean area and Cycladic, Minoan, and Mycenaean cultures.</td>
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<tr>
<td>Clas 5113</td>
<td>Archaic Greek Art. (4 cr, §ArtH 5113; prereq jr or #)</td>
<td>Architecture, sculpture, and painting in Greek lands from 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques.</td>
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<tr>
<td>Clas 5120</td>
<td>Field Research in Archaeology. (3-6 cr per qtr, §ArtH 5120; prereq #)</td>
<td>Field excavation, survey, and research at archaeological sites in the Mediterranean area. Techniques of excavation and exploration; interpretation of archaeological materials.</td>
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<tr>
<td>Clas 5252</td>
<td>History of Early Christian and Byzantine Art. (4 cr, §ArtH 5252)</td>
<td>Architecture, sculpture, and painting in eastern Christian regions from the founding to the fall of Constantinople in the 15th century. Emphasis on meaning and broader cultural context in which works of art were created.</td>
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<tr>
<td>Clas 5340</td>
<td>Practicum in Archaeological Field Techniques. (4 cr, §3340, §CICv 3340; prereq Grk or Lat or Hebr or ANE or CICv major or #, one ancient art or archaeology course) Cooper</td>
<td>Meets with 3340. Additional work for graduate credit.</td>
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<tr>
<td>Clas 1045</td>
<td>Basic Program in Technical Terminology and Word Study. (3 cr)</td>
<td>Prefixes, suffixes, and high frequency roots from Greek and Latin through computer-assisted instruction; principles of word compounding; methods and techniques of word analysis.</td>
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<tr>
<td>Clas 1048</td>
<td>Greek and Latin Terminology in the Medical and Biological Sciences. (2 cr, §1141; prereq 1045 or §1045)</td>
<td>Roots and terms basic to the medical and biological sciences in English contexts.</td>
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<tr>
<td>Clas 1141</td>
<td>Greek and Latin Terminology for Nursing. (3 cr, §1048)</td>
<td>Greek and Latin prefixes, suffixes, and roots basic to the vocabulary of nursing through computer-assisted instruction.</td>
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<tr>
<td>Clas 3046</td>
<td>Advanced Etymology: Vocabulary of the Sciences and Humanities. (2 cr, prereq 1045 or §1045)</td>
<td>Latin and Greek roots with English derivatives; regularities of linguistic change (Grimm's law), principles of etymology, and lessons on specialized terminology in various fields. Computer-assisted instruction.</td>
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### Akkadian (Akka)

#### Akka 5011-5012-5013. Elementary Akkadian.

(4 cr per qtr; for advanced undergrads by permission only and for grads) Reisman

- Cuneiform script.
- Akkadian grammar, written drills, readings from historical annals, law collections, religious, and epic literature.

### Ancient Near Eastern Studies (ANE)

#### ANE 1001/3001. The Bible: Narrative Texts.

(4 cr, §RelA 3201) Paradise, Reisman


#### ANE 1002/3002. The Bible: Prophecy.

(4 cr, §RelA 3202) Paradise, Reisman


#### ANE 1003/3003. The Bible: Wisdom, Poetry, and Apocalyptic.

(4 cr, §RelA 3203) Reisman


(4 cr) Reisman

- The Sumero-Akkadian literary and historical tradition. Relationships of the Mesopotamian traditions, particularly to the Old Testament.


(4 cr, §RelA 3251)

- Methods used in studying the Old Testament, including textual criticism, the anthropological approach, form criticism, the sociological approach, the history of religion, and the uses of archaeology in interpreting the text.
ANE 3501, 3502, 3505. Ancient Israel. (4 cr per qtr; §5501, §5502, §5505, §RelA 3501, §RelA 3502, §RelA 3505, §RelA 5505) Paradise, Reisman
History of Israel and development of its religion from earliest times through the intertestamental period. 3501: The foundation of the Hebrew people; patriarchal period; development of Israelite religions and legal institutions; conquest of Canaan; development of the monarchy and the united kingdom. 3502: The divided kingdom; classical prophecy, destruction, exile, and restoration. 3505: The Hellenistic Period. Period of Ezra and Nehemiah, Samaritans, apocalyptic and other eschatological types; the Maccabean period; Sadducees, Pharisees, Zealots, Christians, Qumran, wisdom literature; Philo, Josephus; Jewish rights during Roman Empire. Evaluation of sources for historical reliability. Knowledge of Hebrew not required.

ANE 5501, 5502, 5505. Ancient Israel. (4 cr per qtr; §5501, §5502, §5505, §RelA 3501, §RelA 3502, RelA 3505; no knowledge of Hebrew required; prereq grad cr or #) History of Israel and development of its religion, from earliest times through intertestamental period. 5501: formation of Hebrew people; patriarchal period; development of Israelite religions and legal institutions; conquest of Canaan; development of monarch of United Kingdom. 5502: divided kingdom; classical prophecy, destruction, exile, and restoration. 5505: The Hellenistic Period. Period of Ezra and Nehemiah, Samaritans, apocalyptic and other eschatological types; the Maccabean period; Sadducees, Pharisees, Zealots, Christians, Qumran, wisdom literature; Philo, Josephus; Jewish rights during Roman Empire. Evaluation of sources for historical reliability. Knowledge of Hebrew not required.

ANE 5970. Directed Studies. (1-4 cr per qtr; prereq #) Guided individual reading or study.

Aramaic (Arm)
Arm 5011, 5012. Aramaic. (4 cr per qtr; prereq 1 yr Hebrew or Arabic or #; for students preparing for biblical studies, ancient history majors, and students specializing in Semitic languages; recommended for students of Talmud) Reisman

Hebrew (Hebr)
Hebr 1012-1013. Beginning Hebrew for Students With Prior Exposure. (5 cr per qtr; total 15 cr for students who complete the sequence) §1101-1102-1103
For students familiar with the Hebrew alphabet and with some previous study of elementary Hebrew.

Hebr 1101F-1102W-1103S. Beginning Hebrew. (5 cr per qtr; prereq #if Hebrew studied previously) Speaking, reading, and writing modern Hebrew. Aural comprehension, pronunciation, basic grammar, biblical syntax.

Hebr 3011F-3012W-3013S. Intermediate Hebrew. (5 cr per qtr; prereq 1103 or qualified fr or #) Modern short stories, contemporary idiom, newspaper articles, biblical narratives. Review of fundamentals of grammar. Emphasizes development of fluent speech and composition.

Hebr 3015F-3016W-3017S. Advanced Modern Hebrew. (4 cr per qtr; prereq 3013 or #) Further development of fluent speech and self-expression in composition; advanced literature and the Hebrew press. Exposure to a variety of literary styles and genres.

Hebr 3111. Rabbinic Texts. (4 cr per qtr; prereq 3013, 3017 or 3022 or #) Selections from Mishnah, Tosefta, Talmud, Midrash. Codes. Critical scholarship. Use of material for history of Judaism.

Hebr 3121. Medieval Hebrew Literature. (4 cr per qtr; prereq 3013 or #) Medieval Bible commentaries; Rashi, Rashbam, Ibn Ezra, Nachmanides, others. Sources in Talmud and Midrash. Contributions of commentators and their methods. Especially recommended for students of biblical literature.

Hebr 3131. Talmudic Texts. (4 cr per qtr; prereq 3013 or 3017 or 3022 or #) Study of a tractate of Talmud: Mishnah, Tosefta, Babylonian, Jerusalem. Critical methods. Redactional and historical problems.

Hebr 3201, 3202, 3203. Readings in Biblical Hebrew. (4 cr per qtr; prereq 1103 or 1104 or #) Textual study of the Bible, basic research tools, and commentaries. Exegesis; development of reading fluency and familiarity with the biblical text.


Hebr 3301. Modern Hebrew Essay. (4 cr; prereq 3017 or #) Works from 19th- and 20th-century Hebrew essayists. Jewish nationalism, literary criticism, social and political issues, religion, philosophy.

Hebr 3304. Modern Hebrew Short Story. (4 cr; prereq 3017 or #) Works of Agnon, Hazaz, Yizhar, Yehoshua, and others. The disintegration of traditional society, freedom, militarism, alienation, genocide, and other themes.
Sanskrit (Skt)

Sanskrit, a major classical language, is the linguistic source of modern North Indian languages and a powerful influence on South Indian languages.

Skt 5131f-5132w-5133s. Beginning Sanskrit. (5 cr per qtr) Malandra

Skt 5161f-5162w-5163s. Advanced Sanskrit. (4 cr per qtr; prereq 5203 or #) Malandra

Skt 5201f-5202w-5203s. Intermediate Sanskrit. (5 cr per qtr; prereq 5133 or #) Malandra

Skt 5970. Directed Readings. (Cr ar; prereq 5970 or #) Malandra

Guided individual reading or study.

Skt 5990. Directed Research. (Cr ar; prereq #) Malandra

Sumerian (Sum)

Sum 5011-5012. Elementary Sumerian. (4 cr per qtr; for advanced undergrads with 2 yrs of another foreign language and for grads) Malandra

Sumerian writing and grammar. Readings from classical Sumerian literary and historical texts.

Religious Studies

Major and minor programs in Religious Studies and a variety of courses in Religions in Antiquity (RelA) are offered through the Department of Classical and Near Eastern Studies (330 Folwell Hall, 612/625-5353).

For information about other CLA courses dealing with aspects of religious texts and experience, consult the listings for Anthropology, Art History, Cultural Studies and Comparative Literature, History, Humanities, Philosophy, Sociology, and South Asian and Middle Eastern Languages and Cultures (Institute of Linguistics and Asian and Slavic Languages and Literatures).

Religions in Antiquity (RelA)

RelA 1031. Introduction to the Religions of South Asia. (4 cr, §RelA 3031, 5031, §SALC 1504, 3031, 5031) Malandra

Historical study of the three traditional religions of India: Hinduism, Buddhism, and Jainism through literature, art, and film. General topics include myth, yoga, asceticism and the religious order of society.

RelA 1034. Introduction to Judaism. (4 cr, §3034, §j wSt 1034, §j wSt 3034) Sellew

Concepts, movements, and institutions in the development of classical Judaism and manifested in the literature and festivals of the Jewish people from Second Commonwealth times to the present.

RelA 1082. Jesus in History. (4 cr, § Clas 1082) Sellew

Earliest attempts to describe Jesus and his significance in the emergent gospel literature of the first-century church. How historians may claim to know the facts of Jesus’ life and its meaning in light of these various presentations. Different literary portraits of Jesus and their reflection of their authors’ social, religious, and political situations. Modern situations and how they shape one’s own reading of the gospels and Jesus.

RelA 3034. Introduction to Judaism. (4 cr, §1034, §j wSt 1034, §j wSt 3034) Sellew

Concepts, movements, and institutions in the development of classical Judaism and manifested in the literature and festivals of the Jewish people from Second Commonwealth times to the present.

RelA 3036. The Religion of Islam. (4 cr, §1036, §5036, §MELC 1536, §MELC 3036, §SALC 3036, §SALC 5036) Farah

Rise of Islam. Role of Muhammad, Koran, traditions; fundamentals and observances of the faith; sectarian movements; the spread of Islam into Asia and Africa; Baha’i, Black Muslims, reformist movements and change.

RelA 3071. Greek and Hellenistic Religions. (4 cr, §Clas 3071, §Clas 5071, §5071) Sellew


RelA 3072. The New Testament. (4 cr, §Clas 3072, §Clas 5072, §5072) Sellew

Early Jesus movement in its social and historical setting: origins in Judaism; traditions about Jesus; Paul, his controversies and his interpreters; questions of authority, religious practice, and structure in early communities; apocryphal literature and emergence of a scriptural canon. Contemporary methods of New Testament study. Ancient sources studied as evidence for constructing critical history and as an attempt to appreciate their narrative structures and other literary techniques.
RelA 3073. Roman Religion and Early Christianity. (4 cr, §5073, §Clas 3073, §Clas 3057) Sellew


RelA 3201. The Bible: Narrative Texts. (4 cr, §ANE 1001, §ANE 3001) Paradise, Reisman

RelA 3202. The Bible: Prophecy. (4 cr, §ANE 1002, §ANE 3002) Paradise, Reisman
Israelite prophets, emphasis on Amos, Hosea, Isaiah, Jeremiah, Ezekiel, and Second Isaiah. Prophetic contributions to Israelite religion, personality of prophets, politics, and prophetic reaction. Textual analysis and biblical scholarship.

RelA 3203. The Bible: Wisdom, Poetry, and Apocalyptic. (4 cr, §ANE 1003, §ANE 3003)

RelA 3251. The Modern Study of the Old Testament. (4 cr, §ANE 3251) Reisman
Methods employed in the study of the Old Testament, including textual criticism, the anthropological approach, form criticism, the sociological approach, the history of religion, and the uses of archaeology in interpreting the text.

RelA 3501. Ancient Israel. (4 cr, §ANE 3501) Paradise, Reisman
History of Israel and development of its religion from earliest times through the intertestamental period. The divided kingdom, classical prophecy, destruction, exile, and restoration.

RelA 3502. Ancient Israel. (4 cr, §ANE 3502) Paradise, Reisman
History of Israel and development of its religion from earliest times through the intertestamental period. The divided kingdom, classical prophecy, destruction, exile, and restoration.

RelA 3505. Ancient Israel: The Hellenistic Period. (4 cr, §5505, §ANE 3505, §ANE 5505) Period of Ezra and Nehemiah, Samaritans, apocalyptic and other eschatological types; the Maccabean period; Sadducees, Pharisees, Zealots, Christians, Qumran, wisdom literature; Philo, Josephus; Jewish rights during Roman empire. Evaluation of sources for historical reliability. Knowledge of Hebrew not required.

RelA 3970f,w,s. Directed Studies. (3-5 cr per qtr; prereq Δ)
Guided individual reading or study.

RelA 5036. The Religion of Islam. (4 cr, §1036, §3036, §MELC 1536, §SALC 3036, §SALC 5036) Farah
Meets with 3036. Additional work for graduate credit.

RelA 5071. Greek and Hellenistic Religions. (4 cr, §3071, §Clas 3071, §Clas 5071; prereq #) Sellew
Meets with 3071. Additional work for graduate credit.

RelA 5072. The New Testament. (4 cr, §3072, §Clas 3072, §Clas 5072; prereq #) Sellew
Meets with 3072. Additional work for graduate credit.

RelA 5073. Roman Religion and Early Christianity. (4 cr, §3073, §Clas 3073, §Clas 5073; prereq #) Sellew
Meets with 3073. Additional work for graduate credit.

5089. Introduction to Biblical Archaeology. (4 cr, §3089, §Clas 3089, §Clas 5089)
For description, see 3089. Requires additional work for graduate credit.

5505. Ancient Israel. (4 cr, §5505, §ANE 3505, §ANE 5505; prereq grad or #)
Meets with 3505. Additional work for graduate credit.

5970. Directed Studies. (3-5 cr per qtr)
Guided individual reading or study.

Coptic
See Classical and Near Eastern Studies.
Communication Disorders (CDis)

Staff—Chair, Charles E. Speaks, 115 Shevlin Hall; Director of Undergraduate Studies, Shirley S. Doyle, 115 Shevlin Hall; Director of Graduate Studies, Joe E. Reichle, 115 Shevlin Hall

Professors: Broen, Davis, Gundel (Linguistics), Haroldson, Margolis (Otolaryngology), Moller (Preventive Sciences), Nelson (Otolaryngology), Reichle, Siegel, Speaks, Starr, Stemberger, Van Tasell, Viemeister (Psychology)

Associate Professors: Carney, Schlauch, Windsor

Assistant Professor: Solomon

Clinical Specialists: Carlstrom, Doyle

Associate Clinical Specialist: Hinderscheit

Assistant Clinical Specialist: van Deusen

The Department of Communication Disorders curriculum focuses on the study of normal speech, language, and hearing, and applying that knowledge to identifying, preventing, evaluating, and clinically managing disordered speech, language, and hearing.

Some students complete the speech and hearing science major and pursue vocational opportunities or graduate study in related fields. Others pursue graduate work in speech-language pathology or audiology. Both the B.S. and B.A. degrees provide appropriate preparation for further education and training as a speech-language pathologist, audiologist, or speech and hearing scientist. The M.A. programs in speech-language pathology and audiology provide the educational and clinical background required to qualify a student for the Certificate of Clinical Competence issued by the American Speech-Language-Hearing Association. If you are contemplating graduate study, consult the director of graduate studies early in your senior year.

General Education—1304, 5301, 5302, 5303, 53041, 5305, and 53061, which address the processes of normal hearing, speech, language, and voice and offer an understanding of the multidisciplinary foundations of human communication. 5103 addresses issues of cultural diversity. Other courses, such as 3101, 5101, and 5102, which survey problems of human communication, and 5502, 55041, 55071, 55081, 55091, 56061, 56071, 56081, 5611, 57011, 57031, and 57041, which deal with specific problems of human communication, may be of interest to students pursuing coursework in linguistics, psychology, child psychology, speech-communication, education, or medical and dental fields.

B.S. Major Sequence—
Speech and Hearing Science
The B.S. degree is appropriate for students who desire a prescribed curriculum that includes related coursework from other departments.

Required Preparatory Courses—Math 1111 or 1031 or 1051; Ling 3001 or 5001; Psy 1001, 1004-1005; Phys 1041 and 1042 or Biol 1009 and Phys 1041 or Biol 1009 and Phys 1001

Major Requirements—5301, 5302, 5303, 5304 or 5306, 5305; CPsy 1301; Psy 3011, 3031; EPsy 5260

Four courses from 3101, 5103, 5304, 5306, 5502, 5504, 5507, 5508, 5509, 5606, 5607, 5608, 5611, 5701, 5702, 5703, 5704, 5705, 5706, 5707, 5900 (clinical issues and procedures)

One of the following groups:
1. at least two courses from CPsy 5341, 5343; Psy 3051, 3135, 5011
2. at least two courses from Ling 5006, 5201, 5202, 5302; CPsy 5345; Psy 5054; EPsy 5600
3. At least two courses from Math 1008, 1142, 1251, 1252
4. Psy 5012-5013
5. at least two courses from EPsy 5620 or CPsy 5315; EPsy 5608, 5609, 5622, 5710

B.A. Major Sequence—
Speech and Hearing Science
The B.A. degree is appropriate for students who desire a broader liberal arts preparation than the B.S. degree provides.

Required Preparatory Courses—Psy 1001, 1004-1005

Major Requirements—3101, 28 cr selected from among the following groups:
1. basic communication processes—5103, 5301, 5302, 5303, 5304, 5305, 5306
2. speech and language disorders—5502, 5504, 5507, 5508, 5509, 5606, 5607, 5608, 5611, 5900 (clinical issues and procedures)
COMMUNICATION DISORDERS

3. disorders of the auditory system—5701, 5702, 5703, 5704, 5705, 5706, 5707, 5900 (clinical issues and procedures)

Major project (2 cr): paper completed in conjunction with extra credit registration in a course from one of the above groups or 5970

Minor Sequence—
Speech and Hearing Science

Minor Requirements—Minimum of 15 cr selected from one or more of the following groups:
1. introductory and survey courses—3101, 5101, 5102, 5103
2. basic communication processes—5301, 5302, 5303, 5304, 5305, 5306
3. speech and language disorders—5502, 5504, 5505, 5507, 5508, 5509, 5606, 5607, 5608, 5611, 5900 (clinical issues and procedures)
4. disorders of the auditory system—5701, 5702, 5703, 5704, 5705, 5706, 5707, 5900 (clinical issues and procedures)

CDIs 1101f,w,s. Introduction to Communication Disorders. (4 cr) Haroldson
Processes and impairments of human oral communication. Stuttering, phonology, voice disorders including laryngectomy, cleft palate, language disorders, augmentative communication, hearing and hearing impairment. Identification and intervention strategies.

CDIs 1304w. The Physics and Biology of Spoken Language. (4 cr) Speaks
The physics and biology of spoken language, from the talker’s production of sounds and words, to the transmission of sound, to the listener’s perception of what was said. Computer analysis and synthesis of speech.

CDIs 3100f,w,s,su. Clinical and Research Observation. (2 cr per qtr; S-N only)
Supervised observation of clinical procedures, such as evaluation and treatment of persons with communication disorders, or of research relating to normal and disordered communication.

CDIs 3101f,w,s. Introduction to Communication Disorders. (4 cr) Haroldson
For description, see CDIs 1101.

CDIs 5101s. Communication Problems of Children. (3 cr; prereq non-speech and hearing science major; offered alt yrs) Doyle, staff
Problems of children with impaired communication due to delayed language development, hearing loss, articulation disorders, voice disorders, stuttering, cleft palate (oral-facial anomalies), and neuromuscular disorders. Communication disorders and their effects on speech and language development.

CDIs 5102s. Communication Problems Associated with Aging. (3 cr; prereq non-speech and hearing science major; offered alt yrs) Starr
Speech, hearing, and language problems associated with aging. Characteristics, etiology, and management. Implications for families, associates, and caregivers.

CDIs 5103s. Communication Disorders and Cultural Diversity. (4 cr) Siegel
Influence of culture on communication disorders and the role of the speech-language clinician in serving diverse populations.

CDIs 5301f. Introduction to Acoustics. (5 cr) Speaks
Elements of acoustics necessary to understand quantitative aspects of speech and hearing science, speech-language pathology, and audiology. Nature of sound, sound transmission, units of measurement, acoustic characteristics of speech, and elementary electronics.

CDIs 5302f. Anatomy and Physiology of the Speech and Hearing Mechanisms. (5 cr) Solomon
Gross anatomy, physiology, and function of structures related to phonation, articulation, and audition.

CDIs 5303f. Phonetics Laboratory. (2 cr) Broen
Phonetic analysis of speech, the IPA classification system and articulatory correlates of English phonemes. Lab transcription of isolated sounds, words, and connected speech.

CDIs 5304w. Speech Science. (4 cr; prereq 5301, 5302, 5303 or #) Speaks
Acoustic characteristics of speech. Theories of and review of research in speech production and speech perception. Techniques for speech analysis and synthesis.

CDIs 5305f. Language Acquisition. (4 cr) Windsor
Theory and experimental research dealing with language development.

CDIs 5306s. Hearing Science. (4 cr; prereq 5301, 5302 or #) Schlauch
Fundamental concepts in normal audition. Psychoacoustic methods; sensitivity and acuity; loudness, pitch, timbre; distortion, aural harmonics; masking, adaptation; auditory reflex; binaural phenomena, localization.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

**CDis 5502s. Stuttering.** (4 cr) Haroldson
Description, nature, and treatment of stuttering in children and adults. Involvement in therapeutic and research activities.

**CDis 5504s. Normal and Disordered Child Phonology.** (4 cr; prereq 5302, 5303 or #) Broen
Theory and research relating to normal and disordered phonological development. Emphasis on assessment and treatment of phonological disorders.

**CDis 5507f. Cleft Palate, Oral-Facial Anomalies, and Speech.** (4 cr; prereq 5304, 5504 or #) Moller, Starr

**CDis 5508w. Voice Disorders.** (4 cr; prereq 5304 or #) Haroldson, Starr
Physical and physiological bases of normal voice production. Voice disorders (pitch, loudness, quality) and their symptomatology, etiology, and clinical management. Laryngectomy. Other organic disorders.

**CDis 5509w. Motor Speech Disorders.** (4 cr; prereq 5304 or #) Solomon

**CDis 5606w. Language Assessment and Intervention: Early Stages.** (4 cr; prereq 5305 or #) Reichle
Communication disorders in preschool-age children with special emphasis on the assessment and management of language disorders observed in children with developmental disabilities as well as intellectually normal children.

**CDis 5607s. Language Assessment and Intervention: Later Stages.** (4 cr; prereq 5305 or #) Windsor
Language disorders in school-age children, with special emphasis on assessment and intervention.

**CDis 5608s. Language Assessment and Intervention: Adults.** (4 cr; prereq 5302 or #) Brookshire
Language disorders in adolescent and adult populations, with special emphasis on assessment and intervention strategies applicable to aphasia and other neurogenic disorders.

**CDis 5611f. Augmentative Systems of Communication.** (4 cr) Reichle
Equipment and instructional procedures used to establish communication board and signing skills in severely handicapped populations.

**CDis 5701w. Hearing Loss and Audiometry.** (6 cr; prereq 5301, 5302 or #) Carney
Overview of hearing disorders: audiometric and medical correlates, medical and surgical management, effects on communication, and psychosocial adjustment. Basic audiometry: pure-tone audiometry, speech audiometry, screening, acoustic immittance. Lab.

**CDis 5702f. Advanced Audiometry.** (5 cr; prereq 5701 or #) Schlauch
Procedures for speech discrimination testing, pediatric testing, detection and evaluation of pseudohypacusis. Behavioral diagnostic procedures for determining site of lesion; auditory pathologies. Lab.

**CDis 5703s. Communication Problems of the Hearing Impaired.** (5 cr; prereq 5701 or #) Carney
Effects of hearing loss on development of language, perception, and production of speech, and psychosocial adjustment. Techniques for habilitation and rehabilitation of hearing-impaired children and adults, including use of amplification, speechreading, and auditory training. Basic instruction in finger spelling and elements of manual communication.

**CDis 5705s. Objective Measures of Auditory Function.** (3 cr; prereq 5701 or # offered alt yrs) Margolis
Advanced techniques for clinical physiological evaluation of the auditory system. Acoustic immittance, auditory evoked potentials; electromyostigmatography, galvanic skin response, electrocardiac response. Lab.

**CDis 5706w. Hearing Aids.** (4 cr; prereq 5701 or #) Van Tasell
Electroacoustic characteristics of personal hearing aids and group amplification systems. Acoustical principles of earmold design and modification. Selection of amplification for hearing-impaired children and adults.

**CDis 5707s. Audiology in Educational Settings.** (3 cr; prereq 5703 or # offered alt yrs) Carlstrom

**CDis 5900. Topics in Communication Disorders.** (1-4 cr per qtr)

**CDis 5970f,w,s,su. Directed Studies.** (Cr ar; prereq #)
Guided individual reading or study.

**Comparative Literature (CLit)**
See Cultural Studies and Comparative Literature.

**Comparative Studies in Discourse and Society (CSDS)**
See Cultural Studies and Comparative Literature.

**Composition**
See English.
Computer Science (CSci)

Institute of Technology

Staff—Head, Ahmed Sameh, 4-192 EE/CS Bldg.; Associate Head, Pen-Chung Yew, 4-192 EE/CS Bldg.; Director of Undergraduate Studies, Shashi Shekhar, 5-203 EE/CS Bldg.; Director of Graduate Studies, Jaideep Srivastava, 4-196 EE/CS Bldg.

Professors: D. Du, D-Z. Du, Fox, Kumar, Norberg, Petzold, Rosen, Saad, Sameh, Shragowitz, Slagle, Stein, Tsai, Yew

Associate Professors: Boley, Carlis, Frankowski, Gini, Janardan, Papanikolopoulos, Park, Riedl, Shekhar, Srivastava, Tripathi

Assistant Professors: Konstan, Li, Teng

Computer science is concerned with the study of the hardware, software (programming), and theoretical aspects of high-speed computing devices, and with the application of these devices to a broad spectrum of scientific, technological, and business problems.

A bachelor’s degree in computer science can be earned in either CLA or the Institute of Technology (IT). Both curricula give students a basic understanding of computer science. After completing a required set of fundamental courses, students can arrange their subsequent work around one of several different upper division options. The curriculum is flexible enough so that a student can build on the basic foundation by means of the upper division. This flexibility allows concentrations within computer science or in interdisciplinary areas involving computer applications. Students may prepare for a variety of industrial, governmental, and business positions involving computer use or for graduate work in the field.

The four-year CLA program leads to the bachelor of arts degree (B.A.) with a major in computer science. The four-year IT curriculum leads to the bachelor of science in computer science (B.S.). A minor sequence in computer science is available through CLA only.

Admission—CLA students interested in the B.A. in computer science should apply directly to the Department of Computer Science. Before applying, students should complete Math 3251 and at least 4 of the 33xx computer science requirements (3311, 3316, 3317, 3321, 3322, 3327) with a grade of C or better. Petition forms for admission are available in the department office (4-196 EE/CSci). Evaluations for admission are based on a minimum modified GPA of 2.50 in the required math and computer science courses. A modified GPA is calculated using F’s equal to zero and repeated course grades not replacing old grades.

B.A. Major Sequence

Required Preparatory Courses—Math 1251, 1252, 1261, 3251, 3261; Stat 3091 or 5121

Major Requirements—CSci 3311, 3316, 3317, 3321, 3322, 3327, 5102, 5106, 5201, 5301, 5400

At least 12 cr in 5xxx computer science courses not listed above

All courses listed above must be taken A-F (except courses offered S-N only).

A grade of at least C is required to satisfy prerequisite and degree requirements.

Minor Sequence

Required Preparatory Courses—Math 1251

Minor Requirements—A minor in computer science consists of 20 credits of approved computer science courses. All courses and prerequisite courses must be taken A-F and be passed with a grade of C or better. Computer science courses for nonmajors and courses from other departments that are equivalent to computer science courses are not acceptable.

Some examples: CSci 3113 is not acceptable because it is a service course and not required by CSci majors. CSci 3321 is acceptable. Honors students can replace CSci 3321 with CSci 3204H and CSci 3205H. If the student has taken EE 3352, then CSci 3327 is not
acceptable because those two courses are equivalent. For more information, contact the computer science undergraduate adviser.

**CSci 1001. Introduction to Computers for Non-Computer Science Majors.** (4 cr; no degree credit for IT students)
History and societal impact of computers; legal and ethical issues in computer usage; basic computer organization; concept of an algorithm; flowcharting; exemplifying the personal computer as a versatile tool by conceptual understanding of and hands-on experience with packages ranging from editing and word processing to symbolic mathematics.

**CSci 3101. Introduction to Computer Applications for Scientists and Engineers.** (4 cr; prereq 1 qtr calculus)
Algorithm development and principles of computer programming using FORTRAN, emphasizing numerical methods for science and engineering applications. Integral open lab.

**CSci 3102. Introduction to Pascal Programming.** (4 cr; prereq non-CSci major, precalc or #; informal lab)
PASCAL computer language, applications, programming techniques. Brings students to advanced-level competence in PASCAL programming. Integral nonscheduled lab.

**CSci 3113. Introduction to Programming in C.** (4 cr, §3121, §3322, or §5113; prereq precalc or #)
Introduction to computer programming in the procedural paradigm. Students use C language to write several programs that illustrate flow control, basic data types (array, record, pointer), and program structuring. Prepares students for more advanced courses in data structures and algorithms.

**CSci 3121. Survey of Data Structures and Algorithms.** (4 cr, §3105, §3321; prereq knowledge of C or 3113 or #)
Fundamental data structures with some of the rudimentary computer algorithms. Students implement these data structures and their operations as abstract data types. Study of C++ with emphasis on implementation of data types and control structures.

**CSci 3204H. Introduction to Programming and Problem Solving in Science and Engineering I.** (2 cr; prereq Calc I, IT Honors or consent of IT Honors office)
Introduction to programming using FORTRAN, designed to meet needs for programming in science and engineering courses and projects. Includes program development and data types, structured and modular programming and subprograms, input/output, and one- and multidimensional arrays, double precision, and complex data types.

**CSci 3205H. Introduction to Programming and Problem Solving in Science and Engineering II.** (2 cr; prereq 3204H, Calc II, IT Honors or consent of IT Honors office)
Introduction to C++ programming sequence, iteration, decision, functions, pointers and arrays. Searching and sorting as example of complexity study. Organization of larger programs. Concept of abstract data type and its implementation using C++ classes.

**CSci 3311. Discrete Structures of Computer Science.** (4 cr, §3400; prereq 3317, 3321)
Mathematical techniques and structures needed in computer science. Topics include formal logic, elementary combinatorics, induction, recurrences, relations, and graphs.

**CSci 3316. Structure of Computer Programming I.** (4 cr, §3106; prereq 1 qtr calculus or #)
Different programming paradigms as a formal way of expressing computer algorithms and data. Procedures, recursion, and iteration as algorithmic development techniques. Use of abstraction and modularity. The language Scheme is used for illustration of ideas and lab problems.

**CSci 3317. Structure of Computer Programming II.** (4 cr; prereq 3316)
Advanced programming paradigms. Object-oriented programming, logic programming, and pattern matching are illustrated with examples. Generic operators, local variables, and objects as ways of encapsulating conceptual parts of a program. The language Scheme is used for illustration of ideas and lab problems.

**CSci 3321. Algorithms and Data Structures I.** (4 cr, §3105, §3121; prereq knowledge of C or 3113 or #)
Fundamental data structures with some of the rudimentary computer algorithms. Students implement these data structures and their operations as abstract data types. Study of C++ with emphasis on implementing data types and control structures.

**CSci 3322. Algorithms and Data Structures II.** (4 cr, §5121; prereq 3311; no grad credit for CSci majors)
Fundamental paradigms for algorithm design with supporting data structures. Complexity, correctness analysis, and lower bound theory. Implementation of selected algorithms and data structures using the C++ language.

**CSci 3327. Introduction to the Organization of Computer Systems.** (4 cr, §3107, §5101; prereq 3316 or 3121 or 3321 or #)
Organization of hardware and software systems that support computer programming and program execution. Symbolic assembly language to study the mapping of application programs and data into the underlying hardware. Ideas illustrated in assembly language programs (currently Motorola 680x0).

**CSci 5090. History of Computing.** (4 cr, §HSci 5321)
Developments in the last century: factors affecting evolution of hardware and software, growth of the industry and its relation to other business areas, and changing relationships resulting from new data gathering and analysis techniques.

**CSci 5101. Introduction to the Organization of Computer Systems.** (4 cr, §3107, §3327; prereq 3121 or 3316, non-CSci major or #; majors should take 3327)
For description, see CSci 3327.
CSci 5102. Introduction to Systems Programming. (4 cr; prereq 3327 or 5101 or #; informal lab; no graduate credit for CSci majors)
User-level programming view of the operating system functions. Introduction to UNIX systems programming. Use of system calls, relationships between C library functions and systems calls, file systems, process management functions, input-output, signal handling, use of pipes and sockets, and shell programming.

CSci 5103. Introduction to Operating Systems. (4 cr; §5502; prereq 3322, 5102 and 5201 or #; informal lab)
Conceptual foundations used in operating system designs and implementations. Relationships between operating system structures and the underlying machine architectures. UNIX implementation mechanisms will be presented as examples.

CSci 5104. System Simulation: Languages and Techniques. (4 cr; prereq 3327 or 5101, Stat 3091 or #; informal lab)
Methodologies relevant to system modeling and simulation. Application of stochastic processes, Markov chains, and queuing theory to developing system models and simulation experiments. Data collection and statistical analysis of output. Fundamentals of discrete event-based simulations using digital computers. Discussion of simulation languages, both process and event oriented, including SIMULA and SIMPAS. Application of these techniques to job shops, operations research, and modeling of computer and communications systems.

CSci 5106. Structure of Higher Level Languages. (4 cr; prereq 3321, 3327, 3317 or #: informal lab; no graduate credit for CSci majors)
Motivation, syntax and semantics, imperative languages (e.g. Ada, C), type system, control structures, procedures, activation record model, exception handlers; Encapsulation, parameterization; functional languages (e.g. Lisp, Scheme, ML or FP); Object-oriented languages, (e.g. Smalltalk, C++ or CLOS); Trends (e.g. concurrent model).

CSci 5107. Computer Graphics I. (4 cr; prereq 3322, 3327, or #)
Introduction to computer graphics. Extensive programming and theoretical underpinnings of computer graphics. General graphics issues, user interface issues, 2D graphics, introduction to 3D graphics (including the 3D pipeline, shading and hidden surface removal, and ray tracing.)

CSci 5109. User Interface Design, Implementation and Evaluation. (4 cr; prereq 3322, 3327, or #: informal lab)
Design, programming, and evaluation of interactive applications with focus on task-centered approach to user interface design. Students work in groups on a course-long project that includes designing, prototyping, evaluating, and implementing an application interface. Experience with interface evaluation techniques including user testing and non-user walkthrough and heuristic techniques.

CSci 5111. GUI Toolkits and Their Implementation. (4 cr; prereq 5110 or 5107 or #: informal lab)
Structure and design of user interface toolkits and frameworks. Includes discussion of window system protocols, toolkits design, event processing, data management and constraints, geometry management, resource management, and other features of advanced interface development toolkits. Completion of a project implementing a toolkit extension or widget.

CSci 5113. Introduction to Object-oriented Programming Using C++. (4 cr; prereq background in C language programming equiv to 3113, §3121, §3321 or §3322; no graduate credit for CSci majors)
Introduction to object-oriented programming in C++ for students who already know how to program in C. Object-oriented programming and inheritance, including polymorphism and multiple inheritance, container classes and iterators, operator overloading, user-defined implicit conversions, constructors, destructors, and templates.

CSci 5117. Computer Graphics II. (4 cr; prereq 5107 or #: informal lab)
Spline curves and surfaces, other advanced modeling techniques, solid modeling, color theory, advanced shading algorithms, advanced ray tracing, radiosity, introduction to scientific visualization.

CSci 5121. Algorithms and Data Structures II. (4 cr, §3322; prereq knowledge of C or 3113 and non-CSci major [CSci major should take 3322])
Fundamental paradigms for algorithm design with the supporting data structures. Complexity, correctness analysis, and lower bound theory. Implementation of selected algorithms and data structures using the C++ language.

CSci 5151. Introduction to Parallel Computing. (4 cr; prereq 3121 or 3322 or #)

CSci 5161. Introduction to Compilers. (4 cr, §5504; prereq 5106 or #: informal lab)
Techniques for implementing programming languages. The compiler front end, recognizing syntactic structures, generating internal representations. Symbol table manipulation and type checking.
CSci 5180. Software Engineering I. (4 cr; prereq 5106 or #; informal lab)
Software life cycle, requirement acquisition, specification, design, coding and testing. Criteria for requirement acquisition, object-oriented analysis and modeling, structures analysis, process description. Specification verification and validation techniques, completeness and consistency techniques, multilevel checking techniques Formal analysis of semi-formal specifications. Object-oriented design techniques, object-oriented design patterns. Current software develop and application environments. Software prototyping, software maintenance and application issues. Students will participate in a group project to develop an application from user requirements.

CSci 5181. Software Engineering II. (5 cr; prereq 5180; scheduled lab)
Requirement analysis. Project planning and management. Design reviews, software testing, validation strategies. Maintenance. Lab with group projects, 12 hours per week project work outside of class time. Selected projects on the process of systems development, from requirements analysis through maintenance. Student groups will specify, design, implement, and test partial software systems. Emphasis on application of general software development methods and principles from 5180, rather than on specific systems.

CSci 5199. Problems in Languages and Systems. (1-4 cr [may be repeated for cr]; prereq #)
Special courses or individual study arranged with a faculty member.

CSci 5201. Introduction to Computer Architecture. (4 cr; prereq 3327 or #; informal lab; no graduate credit for CSci majors)
Elementary computer architecture, gates, and digital logic, register transfers and micro operations, and processor studies of existing systems.

CSci 5211. Data Communications and Computer Networks. (4 cr; prereq 5102 or #; informal lab)
Network classification and services. Hardware components: multiplexers, concentrators, and communications media. Network protocols and architectures. Research areas.

CSci 5212. Network Programming. (2 cr; prereq 5102 or #; §5211; informal lab; no graduate credit for CSci majors)
Network and distributed programming concepts using C++ and UNIX, including TCP/IP, sockets, and RPC applications.

CSci 5221. Advanced Computer Networks and Its Applications. (4 cr; prereq 5211 or #)
Design, maintenance and use of high speed networks and their impact on society. Emphasis on new emergent protocols such as FDDI-II, Frame-Relay, ATM. Characteristics of hardware, protocols and applications such as high performance distributed computing and multimedia.

CSci 5222. Network Operations and Administration. (4 cr; prereq 5211 or #; no graduate credit for CSci majors)
Plan, configure, install, diagnose, performance tune, operate, and manage computer network components.

CSci 5280, 5281. Computer-Aided Design. (4 cr each; prereq 3311; informal lab)

CSci 5299. Problems in Machine Design. (1-4 cr [may be repeated for cr]; prereq #)
Special courses or individual study arranged with faculty member.

CSci 5301. Numerical Computation. (4 cr; prereq Math 3261, knowledge of a programming language or #; informal lab; no graduate credit for CSci majors)

CSci 5302. Analysis of Numerical Algorithms. (4 cr; prereq 5301 or #)

CSci 5304. Computational Aspects of Matrix Theory. (4 cr; prereq 5302 or #; informal lab)

CSci 5305. Numerical Methods for Ordinary Differential Equations. (4 cr; prereq 5302 or #; informal lab)

CSci 5306. Numerical Methods for Partial Differential Equations. (4 cr; prereq 5302, differential equations or advanced calculus or #)
CSci 5320 Introduction to Linear Programming. (4 cr; §5001; prereq 5301 or §; informal lab)
Basic solutions to linear systems; inequalities; convex polyhedral sets; linear programming formulation and optimality conditions; theoretical and computational aspects of simplex algorithm; postoptimality analysis; duality. Revised simplex and numerically stable methods, upper-bounded problems; commercially available LP systems; methods for large, sparse systems. Interior methods for LP.

CSci 5399. Problems in Numerical Analysis. (1-4 cr [may be repeated for cr]; prereq §)
Special courses or individual study arranged with faculty member.

CSci 5400. Introduction to Automata Theory. (4 cr; prereq 3311 or §; no graduate credit for CSci majors)
Turing machines, computable functions, unsolvability of the halting problem, recursive functions. Finite state models; equivalence, minimization, properties, decision questions, characterizations. Regular expressions. Survey of other automata.

CSci 5421. Introduction to Algorithm Design. (4 cr; prereq 58401; prereq 3322, 5121 or §)
Fundamental paradigms for algorithm design. Divide-and-conquer, dynamic programming, the greedy method, maroids, backtracking and branch-and-bound, basic graph algorithms, some techniques for geometric problems, and string matching.

CSci 5422. Advanced Data Structures. (4 cr; §5122; prereq 5421 or §)
Advanced techniques for representing and manipulating data efficiently, and techniques for analyzing the performance of these methods. Priority queues, balanced search trees, multidimensional searching structures, amortized complexity and its applications to data structure design, persistent data structures, and data structures for secondary storage.

CSci 5442. Introduction to Computational Geometry. (4 cr; prereq 5421 or §)
Techniques for the design and analysis of geometric algorithms. The geometric problems studied include many that occur naturally in various applications such as computer graphics, solid modeling, CSD, robotics, manufacturing, vision, etc. Introduction and coverage of both “pure” and “applied” aspects of geometric computation.

CSci 5499. Problems in Computational Theory or Logic. (1-4 cr [may be repeated for cr]; prereq §)
Special courses or individual study arranged with faculty member.

CSci 5511. Artificial Intelligence I. (4 cr; prereq 3322 or §; informal lab)

CSci 5512. Artificial Intelligence II. (4 cr; prereq 5511 or §; informal lab)

CSci 5521. Pattern Recognition. (4 cr; prereq 5301, Stat 3091 or §; informal lab)

CSci 5531. Artificial Intelligence Programming Techniques. (4 cr; prereq 5511 or §; informal lab)
Languages and programming techniques for problems in artificial intelligence. Lisp and Prolog. Production system and frame-based languages. High-level tools. Implementation of knowledge representation structures and inference operations. Applications in expert systems.

CSci 5551. Introduction to Intelligent Robotic Systems. (4 cr; prereq 5511 or §)
Fundamentals of operations of a robot manipulator. Overview of sensing techniques and introduction to their basic principles. Real-time programming issues as applied to the control of a robot. Robot programming and planning.

CSci 5561. Computer Vision. (4 cr; prereq 5511 or §)

CSci 5571. Expert Systems. (4 cr; prereq 5511 or §; informal lab)
Expert systems. Aspects of artificial intelligence representations and inferencing mechanisms. Students will develop a small expert system.

CSci 5599. Problems: Artificial Intelligence. (1-4 cr [may be repeated for cr]; prereq §)
Special courses or individual study arranged with faculty member.

CSci 5702. The Principles of Database Systems. (4 cr; prereq 3322 or §; informal lab)
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

CSci 5703. Database System Design. (4 cr; prereq 5702 or #; informal lab)
Application of database concepts in the design and development of database systems and database applications. Design of current commercial and research-oriented database systems. Techniques of using database systems for applications.

CSci 5705. Object-oriented Databases. (4 cr; prereq 5702 or #)
Applications and motivation; extended relational, object-relational and object-oriented data models; object identifier, types and constructors; versions and schema evolution; query language (recursion, path expressions, etc.); object indices, buffer management and other implementation issues; triggers, rules, complex objects and case studies.

CSci 5799. Problems in Information Science. (1-4 cr [may be repeated for cr]; prereq #)
Special courses or individual study arranged with faculty member.

Cultural Studies and Comparative Literature (CSCL)

Staff—Chair, Richard Leppert, 355 Folwell Hall; Director of Undergraduate Studies, Gary Thomas, 341 Folwell Hall; Director of Graduate Studies in Comparative Studies in Discourse and Society, John Archer, 103 Folwell Hall; Director of Graduate Studies in Comparative Literature, John Archer, 103 Folwell Hall

Professors: Leppert, Sarles, Schulte-Sasse

Associate Professors: Archer, Mowitt, Pomata, Thomas

Assistant Professor: Jha

Cultural Studies and Comparative Literature (CSCL) offers interdisciplinary and cross-cultural studies of how varying modes of discourse (e.g., art, architecture, literature, music, philosophy, religion) are both rooted in and active within history, society, and culture. The objective is an improved understanding of the complex interrelation of ideas, values, social patterns, and material realities, with attention to the subtleties inherent within different styles of thought, genres of expression, cultural contexts, and historic moments.

To declare a major or minor in CSCL, complete a form with the CSCL department’s director of undergraduate studies. This form documents your initial advising session and notifies the CLA Divisional Office of your intention to major or minor in CSCL.

For information about graduate programs in Comparative Literature and Comparative Studies in Discourse and Society, contact the Department of Cultural Studies and Comparative Literature.

Study Abroad—Students are encouraged to study abroad and integrate such study into their undergraduate programs. Credits in relevant fields can be applied toward a CSCL major or minor upon prior approval by the director of undergraduate studies. For information on options and procedures, see Foreign Study.

B.A. Major Sequence

Major Requirements

A. CSCL Department Courses—48 credits to include (1) CSCL 1301 or 1001; 1302, and 1303 (12 credits); (2) Five 3xxx CSCL courses, including courses from at least three of the following four divisions (20 credits): a) Discursive Practices, b) Culture and Conflict: Case Studies, c) Influential Configurations of Knowledge, and d) Social Constructions of the Subject; 3) Four 5xxx CSCL courses, including one CSCL 5990 (Senior Workshop/Major Project) and three additional courses carrying any of the departmental designators (CSCL, CLit, CSDS) (16 credits).

B. Concentration (16 credits)—Four 3xxx-5xxx CLA courses relevant to the declared area of concentration, approved by an adviser. At least one course must be from CSCL, CLit, or CSDS. None of the four courses can be 1xxx (16 credits).

Note: For sections A(2), A(3), and B, departmental (CSCL, CLit, CSDS) topics courses (3910 and 5910) and directed studies (3970 and 5970) will meet stated requirements. Up to four courses in sections A and B, excluding 3xxx and 5xxx department courses, may be taken S-N.

Minor Sequence

Minor Requirements

(Minimum 24 credits)
Six CSCL courses, including a) CSCL 1301 or 1001 (4 credits), and 1302 or 1303 (4 credits); b) three 3xxx courses (12 credits), and c) one 5xxx CSCL course carrying any of the departmental designators (CSCL, CLit, CSDS) (4 credits).
No more than 4 credits of the total program credits may be taken S-N. No more than 4 credits of the total 3xxx-5xxx credits may consist of directed study, directed instruction, or independent study courses.

### Introductory Courses

**CSCL 1001. Introduction to Cultural Studies: Rhetoric, Power, Desire. (4 cr)**
Critical theories and methods for examining texts, artistic forms, and discursive practices that reflect and produce a society’s culture. Case studies from history and the present, including examples from the visual arts, music, video, film, literature, myth, ritual, and the built environment.

**CSCL 1301. Discourse and Society I: Reading Culture. (4 cr)**
Introduction to modes of expression (e.g., verbal, visual, musical) through representative works. Analysis of discourse in relation to social structures, examining its role in creating and contesting social borders, replicating cultures, and attaching differential privilege to various practices.

**CSCL 1302. Discourse and Society II: Meaning and History. (4 cr)**
Examines varied historically grounded case studies to explicate ways in which social and political tensions of particular moments and local milieus find representation in specific items of discourse. Relation of cultural discourses to the sociohistorical conditions of their emergence.

**CSCL 1303. Discourse and Society III: Knowledge, Persuasion, and Power. (4 cr)**
Inquiry into the ways certain bodies of discourse come to cohere, to exercise persuasive power, and to be regarded as authoritative, while others are marginalized, ignored, or denigrated. Inter-relations of center and periphery, hegemony and counter-hegemony, canon and apocrypha.

**CSCL 1921. Introduction to Film Study. (4 cr, §ArH 1921)**
Fundamentals of film language and the major theories of film presented through detailed analysis of several films.

### Intermediate Courses

#### Discursive Practices

Examination of specific discursive modes and critical skills necessary for explicating works within them. Focus on their characteristic systems of production, distribution, and consumption, and the metadiscourses that have grown up around them.

**CSCL 3115. Cinema and Ideology. (4 cr)**
Major aspects of film as discourse with special attention to the complex relations it maintains with the ideological and political contexts in which it appears. Specific films will be used to study cinema as institution, film as current product, and artistic ideologies in politics.

**CSCL 3132. The Modern Novel in a Comparative Perspective. (4 cr)**
Relationship of modernity to the genre of the novel in Western Europe and the Americas. Students will analyze the notions of subjectivity and philosophical reflection as they are manifested in the literatures of various novelists over a variety of literary periods and geographical terrains.

**CSCL 3172. Music As Discourse. (4 cr)**
Close examination of widely varying musical forms and styles, “classical” and “popular,” in relation to larger patterns of culture, ideology, and power.

**CSCL 3174. Poetry As Cultural Critique. (4 cr)**
Damon
Examines the status of poetry in several cultures of the Americas, bringing together techniques of close reading and broad cultural inquiry.

**CSCL 3175. Comedy: Text and Theory. (4 cr)**
Thommas
Interdisciplinary study of comedy and comic theory through time and across world cultures in philosophy, psychology, literature, drama, film, folk tale, play, and social convention.

**CSCL 3176. Oppositional Cinemas. (4 cr; prereq 1301 or ArH 1921) Mowitt**
The way film texts and the social institutions of cinema both contribute to and resist the reproduction of social relations in modern Western countries. Particular attention to class, race, and gender as sites of sociocultural conflict.

**CSCL 3196. Religious Discourses. (4 cr; §RelS 3196)**
Critical analysis of such phenomena as myth, ritual, and cosmology; the grounding of ethical and legal systems in transcendental claims; priestly and prophetic authority; religion as ideology and practice.

**CSCL 3198. Social and Aesthetic Production of Space. (4 cr)**
Archer
Production, distribution, and consumption of architecture and built space in the context of the larger societal framework. Attention to the perception, interpretation, and critique of built form.

### Culture and Conflict: Case Studies

Each of these courses focuses on a particular locus in time and space and explores the multiple discourses that circulated,
complemented, and conflicted with one another, while grounding all of them in the social structures and historic events of which they were a part.

CSCL 3254. Architecture and Society: 1760-1870. (4 cr) Archer
Role of individualism, capitalism, technology, social change, property relations, land use in production of architecture and urban space in Europe and especially North America, 1760-1870. Formal and aesthetic means of articulating social tensions and relations.

CSCL 3276. The West and the World: Literary Perspectives. (4 cr; prereq jr or sr or #)
Novels concerned with the collision between the West and non-Western cultures. Authors such as Melville, Conrad, Forster, Orwell, Achebe, Mac Dun, Tanizaki, V.S. Naipaul.

CSCL 3277. The Family in the Novel, East and West. (4 cr; prereq jr or sr or #)
Cross-cultural study of novels in which family relationships over generations serve as subject matter, theme, and structure. Authors may include the following: Böll, Butler, Faulkner, Lawrence, Mann, Marquez, Muraski, V.S. Naipaul, Pa Chin, Stegner, Tanizaki, Ts’ao Hsûeh-ch’ìn, Turgenev, Woiwode.

Influential Configurations of Knowledge

 Bodies of knowledge that hold privileged status as metadiscourse through which other discourses can be interpreted. Attention to the internal logic, rhetorical figures, and explicative power of such discourses, as well as the processes through which they both gain and lose their influence.

CSCL 3321. Theories of Culture. (4 cr; prereq jr or sr or #)
Sociological, anthropological, philosophical models of culture. Critical analyses of interrelations of art, society, and ideology. Authors include Marx, Durkheim, Freud, Gramsci, Benjamin, Marcuse, Geertz, Derrida, Foucault.

CSCL 3331. Science and the Humanities. (4 cr; prereq jr or sr or #)

CSCL 3361. Visions of Nature: The Natural World and Political Thought. (4 cr, §EEB 3006) Regal
A history from ancient times to the present of theories about the organization of nature, and their significance for the development of ethics, religion, political and economic philosophy, civic, and environmentalism in Western civilization and elsewhere.

CSCL 3366. Landscape and Ideology: 1600-1875. (4 cr) Archer
Cultural construction of nature as concept and as environment. From Puritan “garden in the wilderness” to 18th-century “natural” landscape garden and 19th-century transcendentalism. Role of agriculture, religion, philosophy, aesthetics, property relations, travel, and exploration.

Social Constructions of the Subject

Analyses of gender, sexuality, race, and class as discursive constructions productive of human subjectivity and cultural difference. Attention to the institutions and ideologies through which such difference is transmitted, maintained, or subverted.

CSCL 3412. Psychoanalysis and Literature Part I: The Essential Freud. (4 cr; prereq jr or sr or #)
Theoretical writings of Sigmund Freud, basic concepts of psychoanalytic criticism, the dream and interpretation, the genre of the case study, Freud’s ideas concerning the constitution of ethnicity, culture, identity and gender, fantasy vs. reality, psychoanalysis of the author/character/culture.

CSCL 3413. Psychoanalysis and Literature Part II: Post Freudian Criticisms. (4 cr; prereq jr or sr or #)

CSCL 3421, 3422. Culture and the Production of Modern Identity. (4 cr) Schulte-Sasse, Leppert
History of cultural, perceptual and/or conceptional changes in early modern Western societies, 1600 to 1900, concerning new and conflicting understandings of human imagination, subjectivity, identity, and the body; addressed via the study of medical treatises, philosophy, literature, the visual arts, music, pedagogy; and manners. 3421: 1600-1750, 3422: 1750-1900.

CSCL 3456. Sexualities—From Perversity to Diversity. (4 cr; prereq 1301 or 1302 or 1303 or any women's studies course) Messer-Davidow
Contemporary constructions of Western sexuality (heterosexuality, homosexuality, lesbianism, romance, pornography, erotic domination, and lynching), institutions that constitute or compel them, and moral discourses. Materials include fiction, personal narratives, manuals, ads, journalism, and scholarship and theory from several disciplines.

CSCL 3458. The Body and the Politics of Representation. (4 cr) Leppert
Western representation of the human body, Renaissance to 1900, considering both Western and non-Western peoples. Body’s appearance as site/sight for production of sociocultural difference (race, ethnicity, class, gender). Visual arts, medical treatises, courtesy books, travel literature, ethnographies, erotica.
CSCL 3472. Gay Men and Homophobia in American Culture. (4 cr) Thomas
The historical experience of gay men, the social construction of same-sex desire in American society since 1700, studied in a broad context of (sub)cultural history and discourse, including literature and the arts, journalism, science and medicine, religion, and law.

CSCL 3474. The Political Novel. (4 cr; prereq jr or sr or #) Selected novels from Stendhal to the present; emphasis on critical study of work by major authors; consideration of theories of human nature; relation of the individual and society; philosophy of history and political action; experience and ideology, the political novel as genre.

Topics: Intermediate
CSCL 3910. Topics in Cultural Studies and Comparative Literature. (4 cr per qr; prereq jr or sr or #) Topics specified in Class Schedule.

CSCL 3910H. Honors Course: Topics in Cultural Studies and Comparative Literature. (4 cr; prereq jr or sr or #) Topics specified in Class Schedule.

CSCL 3931. Problems in Stateless Literatures. (4 cr) Jha, staff
Literatures not subsumed under national boundaries. Aesthetics of the governing nation in relation to governed communities in contrast to alternative communitarian modes of language use to relate history and construct identity.

CSCL 3944. Honors Thesis. (4 cr; sr, candidate for magna or summa honors in CSCL, ∆)

CSCL 3970. Directed Studies. (Cr ar; prereq #) Guided individual reading or study.

CSCL 3970H. Directed Studies: Honors. (Cr ar) Guided individual reading or study.

CSCL 3979. Issues in Cultural Pluralism. (4 cr; prereq 3AmSt 3113) Sarles, staff
Critical, comparative basis for studying minority cultures in America: fabric, dynamics, strengths, tensions; how they differ, yet form a distinct culture.

Advanced Courses
Socio-discursive Processes
Analysis of the ways in which material and nonmaterial dimensions of human experience condition one another.

CSCL 5102. Cultural Politics. (4 cr; prereq jr or sr or grad or #) Mowitt
Transformation of the traditional domain of politics once the legitimation and contestation of social power is conducted primarily within the cultural sphere. Attention to how dynamics of marginalization, resistance, and reappropriation come to characterize cultural politics.

CSCL 5154. Theoretical Constructions of Space. (4 cr; prereq jr or sr or grad or #) Archer
Inquiry into theories of space drawn from various disciplines, including anthropology, architecture, geography, history, landscape design, philosophy, planning, and sociology. Areas of intersection and difference; emphasis on new and developing areas of inquiry. Theoretical integration of social and aesthetic concerns.

CSCL 5178. The Political Discourse of Social Change. (4 cr; prereq jr or sr or grad or #) Jha, staff Tension between “tradition” and innovation (of ideas, techniques, material development) in contexts of rapid social change, especially when local cultures come into contact with politically more forceful ones. “Traditions” recast as an already politicized discourse.

Historic Trajectories
Development of significant traditions of thought and expression and their dialectic relation to events and processes that unfold over history of the long duration. Particular attention to shifts in technology, the organization of power, modes of production, and levels of social integration.

CSCL 5256. Suburbia. (4 cr; prereq jr or sr or grad or #) Archer
Ideology and practice of suburbia, from origins in mid-18th century Britain to present-day United States, with particular concern for characteristic architectural and spatial forms in relation to social and political relations.

Analysis of Ideological Systems
Examination of attempts to conceptualize culture and their mystificatory operations. Different theories of ideology studied, as well as whether there are alternatives to ideology within any given society or only alternative ideologies.

CSCL 5301. Society, Ideology, and the Production of Art. (4 cr; §CSDS 5301; prereq jr or sr or grad)
Recent critical theories on the relation of the arts to social and ideological forces; selected artifacts from Western culture (Renaissance to 20th century; high, popular, and mass cultures). Music, visual art, literature.
CSCL 5302. Aesthetics, Ideology, Valuation of Art. (4 cr; prereq jr or sr or grad or #)
Society, ideology, and aesthetic value considered in light of recent critical theories of visual art, music, and literature. Mediations of place, social class, gender, and ideology of aesthetic judgment in post-renaissance Western culture.

CSCL 5392. The Ideology of the Master Narrative. (4 cr; prereq jr or sr or grad or #) Osephides
Totalizing frameworks of explanation as hegemonic discourses whose claim to objectivity and universality rests on an exclusion of other possible discourses and representations. With special attention to ethnography, consideration of usefulness and viability of a polyphonic, postmodernist approach.

CSCL 5398. Phenomenology and Ethnography. (4 cr; §Anth 5394; prereq jr or sr or grad or #) Osephides
Phenomenological/existentialist thought conceived as “the end of ideology”; its politicization during World War II; its use in reflexive anthropology conscious of its own colonial foundations; its use in attempts to understand The Other and in concepts of the person.

Topics: Advanced

CSCL 5711. Interpretation of Myth. (4 cr, §CSDS 5711, §RelS 5111; prereq jr or sr or grad or #)
Structure and function of myths. Myth as social charter, ideological system, and literary form. Readings in classic theories of myth; primary sources from India, Iran, Mesopotamia, Greece, Africa, North and South America.

CSCL 5751. Basic Concepts of Cinema. (4 cr, §CLit 5221)
Intellectual ability to situate film, as a mass cultural phenomenon, in a historical context; current positions in film theory; fundamentals of film analysis. Comparative perspective on mass culture.

CSCL 5910. Topics in Cultural Studies and Comparative Literature. (4 cr; prereq jr or sr or grad)
Topics specified in Class Schedule.

CSCL 5910H. Honors Course: Topics in Cultural Studies and Comparative Literature. (4 cr; prereq jr or sr or grad or #)
Topics specified in Class Schedule.

CSCL 5970. Directed Studies. (Cr ar; prereq jr or sr or grad or #)
Guided individual reading or study.

CSCL 5970H. Directed Studies: Honors. (Cr ar; prereq jr or sr or grad or #)
Guided individual reading or study.

CSCL 5990. Senior Workshop. (4 cr; prereq jr or sr major with ∆)
Student-defined, faculty-assisted collective research project devoted to the comparative, sociohistorical analysis of discursive practices. Faculty and student analysis of cultural artifacts. Primarily for CSCL majors and limited to about fifteen seniors, the Senior Workshop offers an opportunity to apply the skills and knowledge gained in previous courses. Faculty and students together explore issues through original research and class discussion.

Comparative Literature (CLit)

CLit 5147. Dynamics of Pedagogy in Higher Education. (4 cr) Sarles
Nature of teaching and the teacher. Considers teaching authority; dynamics of Socratic dialogue and relation of the teacher to students and to oneself in the present and future.

CLit 5221. Basic Concepts of Cinema. (4 cr) Mowitt
Tools and knowledge necessary to place film in historical context, define major boundaries of film theory, and introduce basic concepts of film analysis. Comparative study of French, English, and American theories.

CLit 5555. Introduction to Semiotics. (4 cr)
Problems of the nature of the sign; sign function; sign production; text; culture; complex sign systems. Application of semiotics to various signifying practices (literature, film, images, television, cities).

CLit 5711. Sociocriticism. (4 cr; prereq 3xxx lit course or #) Ha
Sociological theories of discourse, including Bakhtin, Goldmann, and Foucault, and apply theory to practice in readings of specific texts.

CLit 5910. Topics in Comparative Literature. (3-6 cr per qtr; prereq reading knowledge of French or German or Spanish or #) Topics specified in Class Schedule.

CLit 5970. Directed Reading in Comparative Literature. (1-4 cr per qtr; prereq #)
Guided individual reading or study.

Comparative Studies in Discourse and Society (CSDS)

CSDS 5301. Society, Ideology, and the Production of Art. (4 cr, §CSCL 5301; jr or sr or grad)
Recent critical theories on the relation of the arts to social and ideological forces; selected artifacts from Western culture (Renaissance to 20th century; high, popular, and mass cultures). Music, visual art, literature.

CSDS 5711. Interpretation of Myth. (4 cr, §CSCL 5711; prereq jr or sr or grad)
Structure and function of myths. Myth as social charter, ideological system, and literary form. Readings in classic theories of myth; primary sources from India, Iran, Mesopotamia, Greece, Africa, North and South America.

CSDS 5712. Interpretation of Ritual. (4 cr, §RelS 5112; prereq jr or sr or grad)
Structure and function of rituals. Ritual as symbolic communication, religious action, and technique of social restructuring. Sacrifice, initiation, sacred dance, and other rituals. Theoretical and primary source readings.

CSDS 5910. Topics in Comparative Studies in Discourse and Society. (4 cr; prereq jr or sr or grad)
Topics in comparative, sociohistorical analysis of discursive practices. Individually or team taught. Topics vary quarterly.

CSDS 5970. Directed Studies. (Cr ar; prereq grad, #)
Guided individual reading or study.
Dance
See Theatre Arts and Dance.

Danish
See German, Scandinavian, and Dutch.

Dutch
See German, Scandinavian, and Dutch.

East Asian Studies
See Areas Studies Programs and Institute of Linguistics and Asian and Slavic Languages and Literatures.

Ecology, Evolution, and Behavior (EEB)
College of Biological Sciences

Staff—Head. Patrice Morrow, 100 Ecology Building; Director of Undergraduate Studies, Richard Phillips

Regents’ Professors: Davis, Gorham

Professors: Bamwell, Bimey, Corbin, Cushing, McKinney, McNaught, Megard, Morrow, Phillips, Regal, Schmid, Siniff, Starfield, Tester, Tilman

Associate Professors: Alstad, Beatty, Curtsinger, Packer, Pusey, Shaw

Assistant Professor: Naeem

Adjunct Faculty—Professor: Heinselman (retired forest ecologist)

Associate Professor: Murdock (Bell Museum)

Assistant Professors: Knops, Oberhauser

Ecologists study the evolutionary adaptations of plants and animals to the environment. The ecological perspective encompasses the growth and maintenance of populations and their interactions in communities, and the interrelationships among organisms and physical events in terrestrial and aquatic ecosystems. The behavioral biology perspective deals with adaptations to the environment, mechanisms of behavior, and evolution of social systems.

Courses listed here frequently are taken by students seeking a B.A. degree in biology through CLA.

General Education—Courses especially appropriate for nonmajors include Biol 1106 or 1806 and EEB 1019, 3001, 3006, 3111.

Biol 1106. General Zoology. (5 cr, §1806; prereq Biol 1009 or 1202)
Survey of animal phyla; structure, function, behavior, adaptation, and evolutionary relationships. Lab includes dissections.

Biol 3008. Ecology and Evolution. (4 cr, §Biol 5841; prereq 1009 or 1201, Math 1142 or 1251)
Growth, structure, adaptation, and evolution of populations. Dynamics and evolution of biotic interactions and their effects on the diversity and structure of natural communities. Function and stability of ecosystems.

Introductory Ecology and Behavioral Biology

EEB 1019. Our Changing Planet. (4 cr, §Ast 1019, §Geo 1019)
Interrelationships among Earth’s subsystems—solid earth, oceans, atmosphere and biosphere, and solar and galactic super-systems. Interactions of natural cycles, their rates, feedback, and human impact.

EEB 3001. Introduction to Ecology. (4 cr; open to yrs and above but not to Biol majors)
Basic concepts in ecology; the organization, development, and functioning of ecosystems; population growth and regulation. Human impact on ecosystems.

EEB 3006. Visions of Nature: The Natural World and Political Thought. (4 cr, biomec students may not apply these cr toward the major)
History from ancient times to the present of theories about the organization of nature and their significance for the development of ethics, religion, political and economic philosophy, civics, and environmentalism in Western civilization and elsewhere.

EEB 3111. Introduction to Animal Behavior. (4 cr, §AnSc 3111, §EEB 3811; prereq Biol 1009 or Biol 1201 or Biol 1202 or #)
Biological study of animal behavior including questions of causation, development, function, and evolution; emphasizes evolution of adaptive behavior, especially social behavior, in the natural environment.

Symbols and abbreviations: f, w, su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / $—Credit will not be granted if credit has been received for the course listed after this symbol / #—Concurrent registration is required (or allowed) in the course listed after this symbol / ∆—Approval of the instructor is required for registration / H—Honors course (follows the course number) / ←In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

EEB 5965. Decision Analysis. (4 cr; conservation biology graduate program or #)
Active learning class explores how decision analysis techniques and modeling can be used to clarify issues in conservation biology.

EEB 5970. Directed Studies. (Cr ar; prereq #, ∆; S-N only; a max of 10 cr of 5970 or 5990 may count toward the major requirements)
Individual study on selected topics or problems, with emphasis on selected readings and use of scientific literature.

EEB 5990. Directed Research. (Cr ar; prereq #, ∆; S-N only; a max of 10 cr of 5970 or 5990 may count toward the major requirements)
Lab or field investigation of selected areas of research.

Community Ecology and Paleoeocology

EEB 5004. Earth System: Geosphere/Biosphere Interactions. (4 cr, §Geo 5631; prereq Geo 3202, Geo 3301 or #)
Interdisciplinary study of global change forcing mechanisms, feedbacks and dynamics on various time scales, using paleorecord to illustrate processes.

EEB 5008. Quaternary Ecology. (4 cr; prereq Biol 3008 or Biol 5041 or Biol 5841 or #)
Impact of changes in the physical and biological environment during the Quaternary Period on plants and animals; changes in evolutionary rates, geographical distributions, community composition, and fluctuations in population sizes. Impact of prehistoric human culture on the environment, including ecosystem-level changes recorded in sedimentary sequences. Recent climatic changes. General principles of analysis and methods of investigation and interpretation.

EEB 5014. Ecology of Vegetation. (5 cr; prereq Biol 3008 or Biol 5041 or Biol 5841, 1 qtr statistics or #)
Methods of describing, sampling, and classifying vegetation; spatial and temporal variation of vegetation on landscapes; theory of the structure and dynamics of plant communities. Field trips to local vegetation types; analysis of quantitative data.

EEB 5016. Ecological Plant Geography. (5 cr; prereq Biol 3008 or Biol 5041 or Biol 5841, PBio 3201 or #PBio 3201 or #; offered when feasible)
Vegetation regions of the world in general and North America in detail; ecological principles of plant distribution; interpretation of regional and temporal patterns in the distribution of vegetation and taxonomic groups. Field trips to floristic regions of Minnesota.

Organismal Biology and Physiological Ecology

EEB 5122. Plant/Animal Interactions. (4 cr; prereq Biol 1106 or Biol 1806 or Biol 3011, Biol 1103 or Biol 3012 or Biol 3812, 10 cr bio sci or #; offered when feasible)
Herbivory, pollination, seed dispersal. Implications of interaction for plants and animals at organismal, population, and community levels. Coevolution.

EEB 5129. Mammalogy. (5 cr, §FW 5129; prereq Biol 1106 or Biol 1806 or Biol 3011 or #)
Recent families and orders of mammals of the world and genera and species of mammals of North America, with emphasis on morphology, evolution, and zoogeographic history.

EEB 5134. Introduction to Ornithology. (5 cr; prereq Biol 1106 or Biol 1806 or Biol 3011)
Lab and field course in structure, classification, distribution, migration, habits, habitats, and identification of birds. Weekend trips.

EEB 5136. Ichthyology. (4 cr; prereq 15 cr incl Biol 1106 or Biol 1806 or Biol 3011)
Biological of fishes including development, systematics, anatomy, physiology, and ecology.

EEB 5156. Comparative Animal Physiology. (3 cr; prereq Biol 1106 or Biol 1806 or Biol 3011, Chem 3302 or #)
The passive organism: environmental stresses and biological mechanisms by which they are counteracted.

EEB 5044. Evolution. (4 cr; prereq Biol 1106 or Biol 1806 or Biol 3011, Biol 1103 or Biol 3012 or Biol 3812)
Evidence for and causes of biological evolution.

EEB 5051. Analysis of Populations. (4 cr; prereq Biol 3008 or Biol 5041 or Biol 5841 or #; offered when feasible)
Factors involved in the regulation, growth, and general dynamics of populations. Data needed to describe populations, population growth, population models, and regulatory mechanisms.

EEB 5052. Theoretical Population Ecology. (5 cr; prereq Biol 3008 or Biol 5041 or Biol 5841 or #; offered when feasible)
Theories of population ecology, including models of growth and regulation of single populations, and of interactions between populations, including competition, predation, mutualism; emphasizes assumptions and rationales of models and their predictions for dynamics, stability, and diversity of communities.

EEB 5054. The Process of Evolution. (4 cr; prereq Biol 3008 or Biol 5041 or Biol 5841 or #)
Mechanistic bases of evolution, including causes and consequences of natural selection, stochastic consequences of Mendelian segregation, and their combined influences on the structure of natural and captive populations. Lab exercises based on “Populus” computer simulation software.
EEB 5157. Animal Physiology Laboratory. (3 cr; prereq 5156 or 5323 or AnSci 3301 or AnSci 3301 or Biol 3011 or Biol 3111 or Ent 5030 or FW 5459 or GCB 5114 or #)
Introduction to basic physiological processes in animals using computerized recording and analysis equipment and techniques. Recording and analysis of bioelectric events, transduction of force and displacement into electrical signals, respirometry, spectrophotometry. Independent or team research projects required.

Behavior

EEB 5321. Evolution of Social Behavior. (4 cr; prereq Biol 1106 or Biol 1806 or Biol 3011 or #; offered when feasible)
Current theories and concepts relating to mating systems, spacing systems, and cooperative behavior in animals.

EEB 5323. Mechanisms of Behavior. (3 cr; prereq 3111 or Biol 3011 or #; A-F only)
Neural and hormonal mechanisms that mediate adaptive behavior in invertebrate and vertebrate animals, using a series of well-studied examples to illustrate general principles.

EEB 5324. Evolution of Primate Social Behavior. (3 cr; prereq 3111 or #)
Ecological factors that influence variation in the demography, social structure and social behavior of non-human primates. Application of current evolutionary theory (e.g., kin selection, reciprocity) to the understanding of social behavior.

EEB 5325. Behavioral Ecology. (4 cr; prereq 3111 or 5321 or Biol 3008 or Biol 5041 or Biol 5841 or #; offered when feasible)
Evolutionary principles applied to the study of aggressive competition, mating systems, cooperation, and parental investment. Optimization models used to examine foraging strategies, predator/prey interactions, and territoriality. Evolution of sex, sexual selection, and dispersal.

Limnology and Ecosystem Ecology

EEB 5601. Limnology. (4 cr; §Geo 5601; prereq Chem 1052 or #)
Description and analysis of the events in lakes, reservoirs, and ponds, beginning with their origins and progressing through their physics, chemistry, and biology. Interrelationships of these parameters and effects of civilization on lakes.

EEB 5607. Ecology of Animal Plankton. (5 cr; prereq 5601 or #; Biol 3008 or Biol 5041 or Biol 5841; offered when feasible)
Biology of animal plankton, including distribution of zooplankton in lakes, ecosystem functions such as grazing and remineralization, determination of production, physiological responses to contaminated environments, and important aspects of behavior.

EEB 5608. Ecosystems: Form and Function. (4 cr; prereq 5601 or Biol 3008 or Biol 5041 or Biol 5841 or equiv, advanced writing course such as Comp 3015, 3027, 3033, 3085 or Rhet 3562, ∆)

EEB 5626. Limnology Laboratory. (2 cr, §Geo 5626; prereq 5601 or Geol 5601 or #; offered when feasible)
Techniques for obtaining information about environmental conditions in lakes and streams. Procedures for measuring the abundance and population dynamics of aquatic organisms, with special emphasis on plankton. Field instruments, sampling devices, chemical analysis, microscopy, and analysis of data. One Saturday field trip.

EEB 5652. Community and Ecosystem Processes. (4 cr; prereq 2 qtrs calc, Biol 3008 or Biol 5041 or equiv, 1 additional ecology course in populations or communities or ecosystems or #)
Empirical and theoretical studies at the interface between community and ecosystem studies. Species-based approaches that focus on population dynamics combined with energy- and material-flux-based approaches.

Courses Offered at Lake Itasca Forestry and Biological Station

EEB 5814. Plant Community Ecology. (5 cr; prereq ecol course, ∆)
Communities represented in Itasca Park and vicinity, with emphasis on vegetation. Patterns of distribution of the communities, their interaction with the environment, and their dynamic relationships. Methods of community description and analysis.

EEB 5817. Vertebrate Ecology. (5 cr; prereq ecol course, ∆)
Field studies on vertebrate populations and their relationships to local environments; habitat analysis and ecological research methods. Students work individually and as teams investigating factors influencing distribution and abundance of selected vertebrates in various habitats. Research-oriented course supplemented by lectures and field trips.

Symbols and abbreviations: f,w,s,su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / —Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / ,—In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
EEB 5832. Natural History of Vertebrates. (5 cr; prereq Biol 1106 or Biol 1806, ∆)
Taxonomic survey of local vertebrates, exclusive of birds, and study of morphological, physiological, and behavioral adaptations to different habitats.

EEB 5834. Field Ornithology. (5 cr; prereq general biol course incl study of zoology, ∆)
Emphasis on breeding season, biology, and behavioral ecology of birds in the Itasca Park region. Field trips to a variety of habitats to learn bird identification and to observe and practice techniques for conducting field studies. Lab sessions investigate family distinctions and species identification. Individual field projects.

EEB 5839. Field Studies in Mammalogy. (5 cr; prereq college-level biology course incl study of animals or #, ∆)
Field course emphasizing techniques in study of small mammals. Identification, distributions, community interactions, ecophysiology, population ecology.

Biol 5841. Ecology. (5 cr, §Biol 5041; prereq 1103 or 1106 or 1806 or 3011 or 3012 or 3812, Math 1142 or 1251, ∆)
Growth, structure, and evolution of populations. Pairwise biotic interactions between species and their effect on diversity and structure of natural communities. Nutrient dynamics, function, productivity, and temporal stability of ecosystems. Field work at Itasca station.

Economics (Econ)

Staff—Chair, Craig Swan, 1035 Management and Economics Building; Director of Undergraduate Programs, Simran Sahi, 1035 Management and Economics Building

Regents’ Professor Emeritus: Hurwicz
Regents’ Professors: Chipman, Ruttan
Professors Emeriti: Coen, Mohring, Simler, Smith

Professors: Allen, Chari, Feldman, Foster, Geweke, Jordan, T. Kehoe, Prescott, Richter, Schuh, Swan

Associate Professors: Holmes, Keane, Kiyotaki, McLennan, Rogerson, Werner

Assistant Professors: Kitamura, Merlo, Ohanian, Sahi

Economics seeks to describe how the economy works, defines criteria for assessing its efficiency in providing goods and services, and evaluates alternative techniques of social control intended to increase economic efficiency and equity. A major in economics will be useful if you are contemplating a career in business, law, government, or teaching. For professional work as an economist in government and for college teaching, graduate work is desirable.

Prospective public school teachers should consult the College of Education and Human Development Bulletin.

Because of their difficulty, instructor consent is required for admission to the following courses: 5151-5152, 5161-5162-5163, 5164-5165-5166.

General Education—All courses are open to nonmajors, but those with minimal prerequisites may be of special interest. Classes that require no prior coursework in economics are 1101, 1101H, and 1104. Those that require only 1101 and 1102 as prerequisites are 3315, 3501, 3601, 3701, 3801, 5301, 5307, 5311, 5401 and 5623.

Recommended Enrichment—The economics department encourages its majors and minors to take advantage of educational opportunities such as internships, undergraduate research, honors courses, and foreign study. Students are invited to incorporate study abroad into their major program and will receive appropriate credit on review of courses taken. For information on options and procedures, see Foreign Study.

B.A. and B.S. Majors—The Department of Economics offers four major sequences, two for the B.A. and two for the B.S. The B.S. is more quantitative in orientation than the B.A. The specialized tracks (B.A. quantitative emphasis major program and B.S. mathematics emphasis major program) emphasize particular supporting quantitative skills (calculus, linear algebra, and econometrics), while the two general tracks (B.A. and B.S. major programs) do not require such specific quantitative courses. The senior adviser for majors and premajors is the director of undergraduate programs.

B.A. Major Sequence

The B.A. major program gives students a solid background in economics without assuming they will pursue a career or graduate training in economics. The B.A. major program is the least quantitative of the four major options and offers considerable freedom in course selection from among many upper division electives.
Required Preparatory Courses—1101 or 1101H or 1104 or equiv; 1102 or 1102H or 1105 or equiv; Math 1142 or 1251 or equiv; Stat 1001 or equiv recommended

**Major Requirements**—Part I: Stat 3011-3012 (no credit for Stat 5021)

- 3101 or 3101H, 3102 or 3102H, 3103 or 3103H (3101 must be taken first; 3102 and 3103 may be taken simultaneously)
- 28 3xxx-5xxx cr; may include three courses from Acct 3101; AgEc 3040, 3070, 3500, 3610, any 3- or 4-cr AgEc 5xxx course; BFin 3000, 3300 (only if you have not taken Econ 3751-3752 respectively.) Economics courses reserved for nonmajors do not count toward the 28 cr.

**Part II:** Composition requirement:

- Upper-level writing course, Comp 3014—Writing for the Quantitative Social Sciences or 3027—Advanced Expository Writing (highly recommended)
- Senior project: major paper (obtain guidelines from the department)
- Two courses in the major requirements section may be taken S-N
- GPA requirement: C or better in all courses in the major requirements section.
- 4 cr of directed studies courses (3970, 5970) may be applied toward the major.
- Supporting coursework in computer science, mathematics, and statistics is recommended.

**B.A. Quantitative Emphasis Major Sequence**

The B.A. quantitative emphasis major program adds basic quantitative training (in calculus, linear algebra, and econometrics) to the student’s economics program. This major should be especially attractive to students considering graduate work in business administration or public affairs.

**Required Preparatory Courses**—1101 or 1101H or 1104 or equiv; 1102 or 1102H or 1105 or equiv; Math 1251-1252 or equiv

**Major Requirements**—Part I: Math 1261 or equiv

- Stat 3011-3012 (no credit for Stat 5021)
- 3101 or 3101H, 3102 or 3102H, 3103 or 3103H (3101 must be taken first; 3102 and 3103 may be taken simultaneously); 5211
- 20 3xxx-5xxx cr; may include two courses from Acct 3101; AgEc 3040, 3070, 3500, 3610, any 3- or 4-cr AgEc 5xxx course; BFin 3000, 3300 (only if you have not taken Econ 3751-3752 respectively.) Economics courses reserved for nonmajors do not count toward the 20 cr.

**Part II:** Same as Part II for B.A. major program.

- Supporting coursework in computer science and statistics is recommended.

**B.S. Major Sequence**

The B.S. major program emphasizes a strong quantitative component but is not specifically for students who plan to pursue a career or graduate training in economics. (The major would be suitable for those interested in graduate work in business administration.) The student is given significant freedom in course selection from three quantitative fields (computer science, mathematics, and statistics) as well as from economics.

**Required Preparatory Courses**—1101 or 1101H or 1104 or equiv; 1102 or 1102H or 1105 or equiv; Math 1251-1252-1261 or equiv; a minimum GPA of 2.50 in economics and mathematics

**Major Requirements**—Part I: Stat 5121-5122 or 5131-5132-5133 (5131-5132-5133 are more difficult) (no credit for Stat 5021 or Stat 3011-3012).

- 2 additional courses (at least 4 cr each) from any one area: computer science (at or above 31xx), math (any course at or above 31xx except Math 3142 and Math 5090), or statistics (any 5xxx course except Stat 5021). Courses must be approved by the economics department.
- 3101 or 3101H, 3102 or 3102H, 3103 or
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

3103H (3101 must be taken first; 3102 and 3103 may be taken simultaneously)

Two courses from: 5xxx honors courses; 5113; 5261-5262; 5733; and 5161-5162-5163, 5164-5165-5166. Courses in these last three sequences may be taken S-N.

Part II: 24 3xxx-5xxx cr; may include three courses selected from Acct 3101; AgEc 3040, 3070, 3500, 3610, any 3- or 4- cr AgEc 5xxx course; BFin 3000, 3300; Math 5081, 5242-5243, 5606-5607-5608. Economics courses reserved for nonmajors do not count toward the 24 cr.

Composition requirement: Upper-level writing course, Comp 3014 — Writing for the Quantitative Social Sciences or 3027 — Advanced Expository Writing (highly recommended)

Two courses in the major requirements section may be taken S-N (in addition to 5161-5162-5163 or 5164-5165-5166).

GPA requirement: C or better in all courses in the major requirements section.

4 cr of directed studies courses (3970, 5970) may be applied toward the major.

B.S. Mathematics Emphasis

Major Sequence

The B.S. mathematics emphasis major program is specifically for students interested in graduate study of economics or a career as a professional economist in business, government, or college teaching. The major’s strong quantitative component emphasizes particular quantitative skills such as multivariate calculus, linear algebra, and econometrics—essential in economics graduate training.

Required Preparatory Courses—1101 or 1101H or 1104 or equiv; 1102 or 1102H or 1105 or equiv; Math 1251-1252-1261 or equiv; Stat 3011 or equiv recommended; a minimum GPA of 2.50 in economics and mathematics

Major Requirements—Part I: Math 3251-3261 or equiv;

Stat 5121-5122 or 5131-5132-5133 (no credit for Stat 5021 or Stat 3011-3012)

3101 or 3101H, 3102 or 3102H, 3103 or 3103H (3101 must be taken first; 3102 and 3103 may be taken simultaneously); 5261

Two courses from: 5xxx honors courses; 5113; 5262-5263; 5733; and 5161-5162-5163, 5164-5165-5166. Courses in these last two sequences may be taken S-N.

Part II: Same as Part II for B.S. major program.

Supporting coursework in computer science is recommended.

Minor Sequence

For any of the following minor programs, no more than one course may be taken S-N; a grade of C or better is required in all courses in the minor requirements section.

General Economics

Required Preparatory Courses—1101 or 1101H or 1104; 1102 or 1102H or 1105; Math 1142 or 1251 or equiv

Minor Requirements—3101 or 3105 or equiv

16 additional 3xxx-5xxx cr (advance approval of courses by the economics department is needed)

Up to 4 cr of directed studies courses (3970, 5970) may be applied toward the minor.

Economic Theory

Required Preparatory Courses—1101 or 1101H or 1104 or equiv; 1102 or 1102H or 1105 or equiv; Math 1251-1252 or equiv

Minor Requirements—Math 1261-3251-3261 or equiv

3101, 3102, 3103 or equiv

2 courses from 5107H, 5113, 5733, 5741

Econometrics

Required Preparatory Courses—1101 or 1101H or 1104 or equiv; 1102 or 1102H or 1105 or equiv; Math 1251-1252 or equiv

Minor Requirements—Math 1261 or equiv

Stat 5121-5122 or 5131-5132-5133

3101, 3102 or equiv

5261-5262

4 cr directed studies (5970) for an econometrics research project

International Trade and Development

Required Preparatory Courses—1101 or 1101H or 1104; 1102 or 1102H or 1105; Math 1142 or 1251 or equiv
Minor Requirements—3101 or equiv
5331 (prereq 3102) or 5301
5337 (prereq 3102) or 5307
5431-5432 (prereq 3102, 3103) or 5401
Any country study: 5313 or 3315 or 5315 or 5421 or 3960 or 5311 or 5341

Applied Microeconomics

Required Preparatory Courses—1101 or 1101H or 1104; 1102 or 1102H or 1105; Math 1251 or equiv

Minor Requirements—3101 or equiv
5331 (prereq 3102) or 3501
5631 (prereq 3103) or 3601
5611 or 5621 or 5623
5821 (prereq 3103) or 3801 or 5831 (prereq 3103)
Recommended: 5211 (prereq Stat 3011-3012 or equiv) and 3103

Monetary Economics

Required Preparatory Courses—1101 or 1101H or 1104; 1102 or 1102H or 1105; Math 1142 or 1251 or equiv

Minor Requirements—Stat 3011 or equiv
3101 or 3105, 3102 or equiv
3751-3752
5721 or 3701
5731 or 5741

General

Econ 1101f,w,s. Principles of Microeconomics. (4 cr, §1002, §1005, §1104; prereq knowledge of plane geometry and intermediate algebra at the level of GC 0623 and GC 0631)
Demands and supply; competition and monopoly; the distribution of income.

Econ 1101H. Honors Course: Principles of Microeconomics. (5 cr, §1002, §1005, §1104; prereq knowledge of plane geometry and intermediate algebra at the level of GC 0623 and GC 0631)
Modelling of a basic economy including theory of the consumer and producer. Emphasis on algebra, geometry, and basic logic and proofs.

Econ 1102f,w,s. Principles of Macroeconomics. (4-5 cr, §1001, §1004, §1105; prereq 1101 or equiv, knowledge of plane geometry and intermediate algebra at the level of GC 0623 and GC 0631; B avg recommended)
National income; money and banking; business cycles; international trade.

Econ 1102H. Honors Course: Principles of Macroeconomics. (5 cr, §1001, §1004, §1105; prereq 1101 or equiv, knowledge of plane geometry and intermediate algebra at the level of GC 0623 and GC 0631; B avg recommended)
For description, see Econ 1102.

Econ 1104f,w,s. Principles of Microeconomics. (4 cr, §1002, §1005, §1101; prereq 1 qtr calculus)
For description, see Econ 1101.

Econ 1105f,w,s. Principles of Macroeconomics. (4 cr, §1001, §1004, §1102; prereq 1104 or equiv, 1 qtr calculus)
For description, see Econ 1102.

Econ 1111H. Honors Course: Applied Microeconomics Principles. (5 cr, prereq 1101H or #)

Economic Theory

Econ 3101f,w,s. Microeconomic Theory. (4 cr, §3105; prereq 1101, 1102 or equiv, 1 qtr calculus)
Behavior of households, firms, and industries under competitive and monopolistic conditions; factors influencing production, price, and other decisions of the firm; applications of the theory.

Econ 3101H. Honors Course: Microeconomic Theory. (5 cr, prereq 1101, 1102 or equiv, 1 qtr calculus; B avg recommended)
For description, see Econ 3101.

Econ 3102f,w,s. Macroeconomic Theory. (4 cr; prereq 3101 or equiv)
Determinants of national income, employment, and price level; effects of monetary and fiscal policies; emphasis on a general equilibrium approach.

Econ 3103f,w,s. Welfare Economics. (4 cr; prereq 3101 or equiv)
Relationship among economic efficiency, markets, and society’s goals for the distribution of well-being. Criteria for choosing among alternative distributions of well-being. Applications of the theory to public goods and other situations.
Econ 3103H. Honors Course: Welfare Economics. (5 cr; prereq 3101 or equiv, 1 qtr calculus; B avg recommended)
For description, see Econ 3103.

Econ 3105. Managerial Economics. (4 cr, §3101, §BG 3001; not open to Econ majors; prereq 1101, 1102 or equiv, 1 qtr calculus)
Theory of the firm; managerial decision problems.
Demand theory. Production technology and cost concepts. Pricing and output decisions. Investment behavior.

Econ 5107H. Honors Course: Game Theory and Its Applications. (5 cr; prereq 3101, 3102, 3103 or equiv, Math 1251-1252-1261 or equiv)
Games; normal form and extensive form; wars of attrition; games of timing; bargaining applications in industrial organization, macroeconomics, and international economics.

Econ 5113. Introduction to Mathematical Economics. (4 cr; prereq 3101, 3102, 3103 or equiv, Math 1251-1252-1261-3251 or equiv)
Development in mathematical terms of selected models of economic behavior. Topics selected to illustrate the advantages of a mathematical formulation.

Econ 5151. Elements of Economic Analysis: Firm and Household. (3 cr; prereq 3101 or equiv, 1 qtr calculus, 1 qtr linear algebra, grad or #)
Decision making by households and firms under conditions of competition, monopoly, and monopolistic competition.

Econ 5152. Elements of Economic Analysis: Income and Employment. (3 cr; prereq 3101, 3102 or equiv, 1 qtr calculus, 1 qtr linear algebra, grad or #)
Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding.

Econ 5161-5162-5163. Microeconomic Theory. (5 cr per qtr [no grad cr]; prereq 3103, Math 3251-3252 or equiv, # 5113 recommended)
Decision problems faced by the household and the firm; theories of choice under conditions of certainty and uncertainty. Partial equilibrium analysis of competition and monopoly. General equilibrium analysis. Welfare economics: economic efficiency of alternative market structures; social welfare functions. Dynamics: stability of markets; introduction to capital theory.

Econ 5164-5165-5166. Macroeconomic Theory. (5 cr per qtr [no grad cr]; prereq 3102, 3103, Math 3251-3252 or equiv, # 5113 recommended)
Dynamic general equilibrium models: solving for paths of output, employment and prices. General equilibrium models with uncertainty, search and matching. Implications for measurement and data reporting. Overlapping generations and dynasty models with money and government debt.

Econ 5171. History of Economic Thought. (4 cr; prereq 3101, 3102, 3103 or equiv)
Primarily a critical reading course. Topics include Smith, Ricardo, Malthus, and Marx; neoclassics, Keynes, the mercantilist and physiocratic doctrines; and modern theory.

Econometrics
Econ 5211. Principles of Econometrics. (4 cr, §3231, §5231; prereq 1101, 1102 or equiv, 1 qtr calculus, Stat 3011-3012 or equiv; familiarity with computers [MIS 1070 or equiv, ACSS short courses])
Data analysis and quantitative methods in economics; violation of classical regression model assumptions and consideration of modified estimation procedures that retain desirable properties; multi-equation models. Computer applications and interpretation of empirical results.

Econ 5261f-5262w-5263s. Introduction to Econometrics. (5 cr per qtr [no grad cr]; prereq 3101 or equiv, Stat 5121-5122 or Stat 5131-5132-5133, Math 1251-1252, Math 1261 or equiv or #)
Review of basic linear regression model and its variants; panel data, censored and truncated regression, discrete choice models; time series and simultaneous equation models.

Economic Development, Comparative Systems, Area Studies
Econ 3315. The Japanese Economy. (4 cr, §5315; prereq 1101, 1102 or equiv; not open to Econ majors)
Economic development following contact with Western civilization. Current problems; population growth, capital formation, international economic relations.

Econ 5301. Economic Development. (4 cr, §5331; prereq 1101, 1102 or equiv; not open to Econ majors)

Econ 5307. Comparative Economic Systems. (4 cr, §5337; prereq 1101, 1102 or equiv; not open to Econ majors)
Functions of economic systems; market economy vs. centrally planned economy. Post socialist transitions in Eastern Europe and reforms in China. Initial conditions and strategies for reforms; results of reforms in terms of key economic indicators.

Econ 5311. Economy of Latin America. (4 cr, §5341; prereq 1101, 1102 or equiv; not for Econ majors)
Economic evolution in Latin America since 1950. Issues discussed include trade liberalization, poverty, inflation, and development strategies in selected Latin American countries. Theory and applications of important issues.

Econ 5312. Technology and Development. (4 cr; prereq 3101, 3102 or equiv or #)
Economics of research and development; technical change and productivity growth; impact of technology on institutions; science and technology policy.

Econ 5313. The Russian Economy. (4 cr; prereq 3101, 3102 or equiv)
Econ 5315. The Japanese Economy. (4 cr, §3315; prereq 3101 or equiv)  
For description, see Econ 3315.

Econ 5331. Economic Development. (4 cr, §5301; prereq 3101, 3102 or equiv)  
For description, see Econ 5301.

Econ 5337. Comparative Economic Systems. (4 cr, §5307; prereq 3101, 3102 or equiv)  
For description, see Econ 5307.

Econ 5341. Economy of Latin America. (4 cr, §5311; prereq 3101, 3102, or equiv or #)  
For description, see Econ 5311.

International Economics

Econ 5401. International Economics. (4 cr, §5429, §5431, §5432; prereq 1101, 1102 or equiv; not open to Econ majors)  

Econ 5421. Economic Integration in the Americas. (4 cr; prereq 3101, 3102, 3103 or equiv or #)  
Analysis of economic relationships among countries in the Western Hemisphere. Modeling the impact of NAFTA and similar regional trade accords. Prospects for further integration.

Econ 5431. International Trade. (4 cr, §5401, §5429; prereq 3101, 3102, 3103 or equiv)  

Econ 5431H. Honors Course: International Trade. (5 cr, §5401, §5429; prereq 3101, 3102, 3103 or equiv, 1 qtr calculus; B avg recommended)  
For description, see Econ 5431.

Econ 5432. International Finance. (4 cr, §5401; prereq 3101, 3102, 3103 or equiv; 5431 or equiv recommended)  
Balance of payments, foreign exchange market, exchange rate determination. International monetary system.

Labor Economics

Econ 3501. Labor Economics. (4 cr, §5531; prereq 1101, 1102 or equiv; not open to Econ majors)  
Role of labor in economy: labor as a factor of production, population and the labor force; economics of labor markets; labor market institutions; theories of wages and employment; unions and collective bargaining; public policy.

Econ 5531. Labor Economics. (4 cr, §3501; prereq 3101, 3102 or equiv)  
For description, see Econ 3501.

Industrial Organization, Housing, Resource and Urban Economics

Econ 3601. Industrial Organization and Antitrust Policy. (4 cr, §5631; prereq 1101, 1102 or equiv; not open to Econ majors)  

Econ 5611. Environmental Economics. (4 cr, §5611; prereq 1101, 1102 or equiv; not for econ majors)  
Renewable and non-renewable natural resources: fish, water, timber, minerals, petroleum. Environmental concerns versus trade and development. Cost-benefit analysis to measure environmental impact. Externalities and property rights. Pollution control.

Econ 5611H. Honors Course: Resource and Environmental Economics. (5 cr; prereq 3101 or equiv, 1 qtr calculus; B avg recommended)  
For description, see Econ 5611.

Econ 5621. Urban Economics. (4 cr; prereq 3101 or equiv)  

Econ 5623. Housing Markets and Public Policy. (4 cr; prereq 1101, 1102 or equiv)  

Econ 5631. Industrial Organization and Antitrust Policy. (4 cr, §3601; prereq 3101, 3103)  
For description, see Econ 3601.

Econ 5631H. Honors Course: Industrial Organization and Antitrust Policy. (5 cr; prereq 3101, 3103 or equiv, 1 qtr calculus; B avg recommended)  
For description, see Econ 5631.
Monetary Economics and Macroeconomic Policy

**Econ 3701. Money and Banking.** (4 cr, §5701, §5721; prereq 1101, 1102 or equiv; not open to Econ majors)
Historical development, present characteristics, and economic role of financial institutions. Commercial banking, the Federal Reserve system, and monetary policy.

**Econ 3751-3752. Financial Economics I and II.** (4 cr per qtr; prereq 3101 or 3105, 1 qtr statistics, 1 qtr calculus)

**Econ 5721. Money and Banking.** (4 cr, §3701, §5701; prereq 3101, 3102 or equiv)
Theories of money demand and money supply. Financial intermediation and banking, role of the Federal Reserve system. Monetary policy.

**Econ 5721H. Honors Course: Money and Banking.** (5 cr; prereq 3101, 3102 or equiv, 1 qtr calculus; B avg recommended)
For description, see Econ 5721.

**Econ 5731. Macroeconomic Policy.** (4 cr; prereq 3101, 3102 or equiv)
Monetary vs. fiscal policy debate in the context of the underlying macroeconomic theory controversy. Comparison of Keynesian, Monetarist, and Classical theories; rational expectations; policy ineffectiveness; time inconsistency; rules vs. discretion; budget deficits; unemployment and inflation.

**Econ 5731H. Honors Course: Macroeconomic Policy.** (5 cr; prereq 3101, 3102 or equiv, 1 qtr calculus; B avg recommended)
For description, see Econ 5731.

**Econ 5733. Intertemporal Economics and Money.** (4 cr per qtr; prereq 3101, 3103 or equiv, Math 1251-1252-1261 or equiv)
Real intertemporal economics: overlapping-generations models of interest rates; applications to social security and deficit finance. Representative agent model, Ricardian Equivalence, introduction to the neoclassical growth model.

**Econ 5741. Business Cycles.** (4 cr; prereq 3101, Stat 3011 or equiv)
Models of economic growth are developed and matched to U.S. data; review of business cycle facts; the growth model is used to examine the impact of changes in important growth factors including public finance and technology and for business fluctuations.

**Econ 5741H. Honors Course: Business Cycles.** (5 cr; prereq 3101, 3102, Stat 3011 or equiv, 1 qtr calculus; B avg recommended)
For description, see Econ 5741.

**Econ 5752H. Honors Course: Financial Economics II.** (5 cr, §3752; prereq 3751; B avg recommended)
Efficiency of financial markets. Includes theoretical concepts and empirical evidence.

Public Finance

**Econ 3801. Elements of Public Economics.** (4 cr, §5821; prereq 1101, 1102 or equiv; not open to Econ majors)
Competing views on the proper role of government in the economy. Effects of tax and spending policies, taking into account private agents’ response to government actions and the ways government officials may use their powers; optimal policies. Applications primarily to U.S. federal government.

**Econ 5821. Introduction to Public Economics.** (4 cr, §3801; prereq 3101, 3103 or equiv)
For description, see Econ 3801.

**Econ 5831. Cost-Benefit Analysis.** (4 cr; prereq 3101, 3103 or equiv)
Principles for evaluation of benefits and costs of public projects or programs. Definition and measurement of benefits and costs. Rate of return and rate of discount. Treatment of market imperfections, risk, and uncertainty.

**Econ 5831H. Honors Course: Cost-Benefit Analysis.** (5 cr; prereq 3101, 3103 or equiv, 1 qtr calculus; B avg recommended)
For description, see Econ 5831.

Directed Study

**Econ 3951. Major Project Seminar.** (2 cr; prereq 3101, 3102, 3103 or equiv)
For description, see Econ 3951.

**Econ 3960. Topics in Economics.** (4 cr per qtr; prereq 1101, 1102 or equiv [others may be stated in Class Schedule])
Topics specified in Class Schedule.

**Econ 3970. Directed Studies.** (Cr ar; prereq #)
Guided individual reading or study in areas not available in regular course offerings.

**Econ 5960. Topics in Economics.** (4 cr per qtr; prereq 3101, 3102, 3103 or equiv [others may be stated in Class Schedule])
Topics specified in Class Schedule.

**Econ 5970. Directed Studies.** (Cr ar; prereq #)
For description, see Econ 3970.

College of Education and Human Development

Descriptions of degree programs and courses in the College of Education and Human Development (CEHD) can be found in the bulletin of that college. See also the summary of CEHD programs on page 287.

Credit for all courses listed in the CLA Bulletin and all courses approved for the Twin Cities campus liberal education curriculum (see current Class Schedule) may be applied toward CLA baccalaureate degrees and the CLA residency requirement.

In addition, CLA students may apply toward their degrees up to 28 credits of other UMTC courses that are not part of the liberal education curriculum.